

253, 6  
H2R  
1917

NINTH BIENNIAL REPORT

OF THE

# State Board of Health

FOR

1917 - 1918

---

SIXTH BIENNIAL REPORT

OF THE

State Registrar of Births and Deaths

1916 - 1917

---

W. F. Cogswell, M. D., *Secretary*

Montana State Library



3 0864 1006 4831 3

NINTH BIENNIAL REPORT

OF THE

State Board of Health

FOR

1917 - 1918

---

SIXTH BIENNIAL REPORT

OF THE

State Registrar of Births and Deaths

1916 - 1917

---

W. F. Cogswell, M. D., *Secretary*

INDEPENDENT PUBLISHING CO.  
HELENA, MONTANA



**MEMBERSHIP OF THE  
MONTANA STATE BOARD OF HEALTH**

---

D. J. DONOHUE, M. D., President, Butte  
W. J. BUTLER, D. V. S., Vice-President, Helena  
HON. S. V. STEWART, Governor, Helena  
HON. S. C. FORD, Attorney General, Helena  
E. F. MAGINN, M. D., Butte  
M. M. DEAN, M. D., Helena  
W. F. COGSWELL, M. D., Secretary, Helena

DEPARTMENT OF PUBLIC HEALTH  
OF THE STATE OF MONTANA

---

OFFICE OF THE SECRETARY  
Helena

December 31, 1918.

Hon. Samuel V. Stewart, Governor,  
Helena, Montana.

Sir:

In compliance with the provisions of the laws of the State of Montana, I hand you herewith the Ninth Biennial Report of the State Board of Health, and the Sixth Biennial Report of the State Registrar of Births and Deaths.

I wish, at this time, to express my appreciation of the hearty support given me by yourself and other members of the State Board of Health.

Respectfully submitted,

W. F. COGSWELL,  
Secretary.

## CONTENTS

	Page
Recommendations .....	4
Communicable Diseases .....	6
Spotted Fever .....	6
Smallpox .....	6
Typhoid Fever .....	6
Diphtheria .....	7
Scarlet Fever .....	7
Tuberculosis .....	7
Measles .....	7
Spanish Influenza .....	8
Child Welfare Division .....	13
Hygienic Laboratory .....	17
Venereal Disease Division .....	22
Licensed Embalmers .....	31
School Buildings .....	31
Vital Statistics .....	31
Division of Foods and Drugs .....	58
Division of Water and Sewage .....	62
Report of the Chemist .....	63
Report of Water and Sewage Laboratory .....	66
Report of Food and Drug Laboratory .....	83

## RECOMMENDATIONS

---

### LOCAL AND COUNTY HEALTH OFFICERS

The present law by which local and county health officers are appointed is unsatisfactory. Some provision should be made whereby whole time county and local health officers could be appointed. We realize it is very difficult to formulate a law covering the whole state on account of the fact that new counties are continually being created. At the present time there is nothing to prevent cities and a county uniting in employing a whole time health officer. This has been done in Yellowstone County—Billings and Yellowstone County uniting for this purpose. The plan has been tried out for over a year and the results are very satisfactory. Other counties are becoming interested in the Yellowstone County experiment and no doubt within the next two years several whole time health officers will be appointed.

---

### EPIDEMIOLOGIST

The office of epidemiologist should be created for the purpose of studying the incidence of communicable disease and co-operating with the local and county health departments in the suppression of the same. We earnestly recommend that such an office be created.

## COMMUNICABLE DISEASES

---

### SPOTTED FEVER

During the year 1917 there were twenty-one cases of spotted fever reported in the State, fifteen of these occurring in the eastern part of the State, being of the Idaho type and much milder than those occurring in the Bitter Root Valley. There were six cases reported in the Bitter Root Valley with five deaths. During the year 1918 there were six cases of this disease reported.

At the close of the tick season in 1917 the United States Public Health Service and the Bureau of Entomology withdrew from control work in the Bitter Root Valley, so that during the year 1918 it was necessary for the State to continue alone this work. This was done by the State Board of Entomology. A complete report of this Board's activities will be found in its Third Biennial Report.

### SMALLPOX

During the year 1917 there were 1,346 cases of smallpox reported in the State. During the year 1918, 1,104 cases. On account of the fact that the disease in Montana during recent years has been of a very mild type, people are neglecting vaccination. A law should be passed requiring children to present a certificate of successful vaccination when they first enter school. The State Board of Health has authority in the presence of an epidemic to order the vaccination of school children. This was done in six instances during the year 1918, with the result that about fifteen thousand school children were vaccinated. In one instance the anti-vaccinationists resisted the order of the State Board of Health and appealed to the Court, but the Court upheld the action of the Board.

### TYPHOID FEVER

During the year 1917 there were 522 cases of typhoid fever reported in the State. During the year 1918, 179 cases were reported. This marked diminution in the number of cases is, no doubt, due to the fact that the Legislature of 1917 passed a law placing all public water supplies

directly under the supervision of the State Board of Health, and requiring regular analyses of all waters supplied the public. This law will be found in the appendix.

### DIPHTHERIA

During the year 1917 there were 289 cases of diphtheria reported. In the year 1918 there 309 cases. In one town where an epidemic of this disease occurred it was not controlled until cultures were taken from pupils and teachers in the schools. It was found that one of the teachers was a carrier. As soon as she was isolated the epidemic subsided.

### SCARLET FEVER

During the year 1917 there were 1,545 cases of scarlet fever reported in the State. In the year 1918, 1,609 cases. The experience of the State Board of Health in handling this disease is that it can be controlled very much better by keeping the schools open and employing regular health supervision. This is generally done through the services of the school nurse.

### TUBERCULOSIS

During the year 1917 there were 272 cases of tuberculosis reported. During 1918, 218. This does not represent by any means the number of cases in the State as we are getting very incomplete reports from the doctors on this disease.

The State Anti-tuberculosis Society has organized to do survey work in connection with this disease and we expect much fuller reports in the future. The great difficulty the Anti-tuberculosis Society has encountered in its survey work is securing proper treatment for cases of tuberculosis. The State Sanatorium can only accommodate a very limited portion of the cases in the State. Unfortunately in the past the incurable cases have been sent to the State Institution, whereas this institution should only receive incipient cases. The counties should make arrangements to care for the incurables.

### MEASLES

During the year 1917 there were 3,484 cases of measles reported in the State. During 1918 there were 12,086 cases.

## SPANISH INFLUENZA

During the early days of September 1918, Spanish Influenza made its appearance in epidemic form in eastern Massachusetts. Within from three to four weeks this epidemic was nation-wide. All control measures instituted by the various health organizations of the country appeared to have but little influence in checking the disease.

It was in the latter days of September that the disease made its first appearance in Montana, appearing in the northeastern part of the State, and spreading rapidly to the different towns of the State. In the early days of November the disease spread rapidly to the rural districts. An increase in the number of cases in these districts being particularly noticeable after the State-wide celebration of the Peace Armistice—probably due to the fact that the people from the rural districts gathered in the towns for the celebration.

On the first appearance of the disease in Montana, the Secretary of the State Board of Health issued emergency control regulations, and made the disease a reportable one. These emergency regulations were later formally adopted at a special meeting of the State Board of Health. But realizing that such control measures had not prevented the epidemic in other states, and that the State of Montana was in for a serious epidemic, the State Board of Health centered its energies upon relief work. Realizing that due to the war and the patriotism of the Montana doctors and nurses there was a very great shortage in these professions in the State, and knowing that if the people were properly cared for there must be help from the outside, the State Board of Health wired the Surgeon General of the United States Public Health Service asking for six doctors and at least twenty-five nurses. The Surgeon General immediately sent us eight doctors as follows: Dr. A. E. Baldwin, Kettle Falls, Wash.; Dr. May L. Barnhart, Portland, Ore.; Dr. H. A. Bauchamp, Stayton, Ore.; Dr. Edward Bennett, Monroe, Ore.; Dr. H. E. Currey, Baker, Ore.; Dr. Homer Denman, Spokane, Wash.; Dr. W. H. Heckman, Central Point, Ore.; Dr. J. H. Seiffert, San Diego, Cal. These doctors were ordered by the Public Health Service to report to the Secretary of the State Board of Health, who was put in charge

of the activities of the United State Public Health Service in the State of Montana, and who was also given authority by this Service to nominate doctors in Montana for the position of Acting Assistant Surgeon to the United States Public Health Service, and to detail them for emergency influenza work. An appeal was made to those doctors of the State who could be spared from their own communities to come forward and do relief work. As a result of this appeal the following named doctors promptly responded: Drs. O. M. Lanstrum, W. M. Copenhaver, and Mary B. Atwater, Helena; Dr. E. M. Wilson, Twin Bridges; Dr. A. C. Jones, Butte; Dr. M. W. Feenan, Anaconda; Dr. J. J. Leiser, East Helena; Dr. B. F. Rundle, Billings; Dr. P. F. Metz, Miles City; Dr. A. C. Dogge, Polson; Dr. L. R. Carson, Willsall and Dr. W. H. Blackmore, Ingomar. Besides these there were several retired physicians living on ranches who did valuable work in their communities.

On behalf of the State of Montana the State Board of Health wishes to thank these men for the valuable services which they rendered, and it also wishes to thank the United States Public Health Service for making it possible to bring in outside doctors and nurses and placing them under the control of one central department.

The American Red Cross Nursing Service, although sorely taxed for nurses in other states, was able to send to the State of Montana seven nurses. On the appearance of the epidemic the Director of the Child Welfare Division of the State Board of Health was placed in charge of this service in Montana. The Local Red Cross Chapters of the State did splendid work in establishing emergency hospitals and in furnishing volunteer nurses aides. Without the service rendered by the splendidly organized Red Cross Chapters in Montana, relief work would have been in a state of chaos.

The State Anti-tuberculosis Society turned over to the Secretary of the State Board of Health Two Thousand Dollars of its funds to be used in the employment of nurses where needed. This aided very greatly in the work. On account of having this fund at his disposal the Secretary was able to bring nurses from Canada and the State of Washington as well as employ state nurses. There was

splendid teamwork in all relief organizations throughout the State.

Now that the epidemic has apparently, to some extent subsided, it might be well to look back and see what a swath it cut in the State of Montana. During the month of October, 19,980 cases were reported to the State Board of Health. During the month of November 12,177 cases, and in December 5,410. Making a total of 37,567. But this does not represent the full number of cases as the reports were incomplete. The doctors claiming in a great many places that they were too busy to make official reports. The death reports are much more accurate and have been compiled for October, November and December. They are as follows: October, influenza, 143, influenza-pneumonia, 889. Total 1032. November, influenza, 260, influenza-pneumonia, 1210. Total 1471. December, influenza, 144, influenza-pneumonia, 575. Total 719. Total deaths during these three months from influenza and influenza-pneumonia, 3222. Some indication of the seriousness of the epidemic is shown by the fact that while the normal average monthly death rate in Montana is about five hundred, in October it jumped up to 1,580, in November to 1997, and in December to 1114.

The disease is still with us and in some of the towns there seems to be evidences of secondary epidemics. Some of the best sanitarians in the country basing their judgments upon the influenza epidemics which appeared in the country in 1889 and 1890 predict that there is a liability that this country will be visited next year by an influenza epidemic just as severe. In view of this fact it behooves the State of Montana to take appropriate action to meet any future possible emergency. Our local health departments should be thoroughly organized and put in charge of whole-time health officers. In many places in the State, during the epidemic, the local health departments completely broke down on account of the fact that the local health officer was too busy responding to the calls of the sick to attend to his duties as a health official.

The State Board of Health should be given power to appoint an epidemiologist to assist the Secretary in handling all epidemics. An emergency appropriation of at least Twelve Thousand Dollars should be made by the State

Legislature. While the United States Public Health Service came forward and spent approximately Seven Thousand Dollars in the State during this epidemic, and the American Red Cross an amount not yet determined, and the State Anti-tuberculosis Society the sum of Two Thousand Dollars, yet the State Board of Health was unable from its own funds to spend any money for relief work. We should have a fund from which we could draw to organize, in an emergency such as we have just gone through, a mobile force of doctors and nurses to relieve stricken communities. While we were able, through the agencies mentioned, to respond to fifty-five calls for nurses and thirty-two calls for doctors, we were unable to make one such response on behalf of the State of Montana and as a consequence aid in many stricken communities could not be given.

---

The use of vaccine in the prevention of influenza or the complications of this disease is in the experimental stage. Repeated reports of the value of a vaccine prepared by Dr. E. C. Rosenow of Rochester, Minnesota, led the State Board of Health to send its bacteriologist back to make an investigation concerning the value of this vaccine and also to familiarize himself with the methods of preparation. Dr. McCray spent two weeks in Dr. Rosenow's laboratory investigating reports and the methods of preparation of the vaccine. He considered the reports sufficiently encouraging to justify the State Board of Health in taking steps to supply as much as possible of this vaccine to local health departments in the State which were sufficiently well organized to administer it free to people wishing to take the treatment.

Through the courtesy of Dr. Rosenow we have been able to do this. The vaccine has been sent to our laboratory in a highly concentrated form and there diluted to the required strength. Many of the local health departments have been supplied and a number of them have been able to get the vaccine direct from the Rosenow Laboratory.

While reports from the health officers who have administered this vaccine in any quantity are encouraging it is too soon yet to determine its real value. The attitude

of the State Board of Health is that this vaccine is in the experimental stage, will do no harm and may do good. We do not urge the people to take it but we wish to be in a position to furnish it if it is wanted. It is not claimed that this vaccine will prevent influenza but it is claimed by the maker that it will prevent complications such as pneumonia, and, in a large majority of cases, death. If it will do this it is worth trying. Our laboratory at the present time has on hand about ten quarts of this vaccine which will be furnished free to those health departments who are prepared to give it free to the people wanting it.

## CHILD WELFARE DIVISION

---

This Division was created by the law passed during the session of the Legislature in 1917.

This law gives school boards authority to employ school nurses and the county commissioners authority to employ county nurses, and places all public health nurses under the direction of the State Board of Health. This law will be found in the appendix.

A Public Health Nurse was appointed Director of this Division and very valuable work has been done as will be seen by the report that follows:

### DEPARTMENT OF PUBLIC HEALTH

Child Welfare Division

Helena

January 1st, 1919.

Dr. W. F. Cogswell, Secretary,  
State Board of Health,  
Helena, Montana.

Dear Sir:

I have the honor to transmit herewith the report of the Child Welfare Division from March 19th, 1917 to January 1st, 1919.

The Child Welfare Division was created in the State Board of Health by the passage of House Bill 223, by the Legislative Assembly of 1917. The Bill became a law March 3rd, 1917.

Shortly after this law went into effect, in compliance with Section 5, the Secretary of the State Board of Health and the State Superintendent of Public Instruction drew up the regulations governing public health nurses. These regulations were passed by the Board of Health at their regular meeting on April 5th, 1917. The appointment of Margaret Hughes as Director of the Child Welfare Division was confirmed by the State Board of Health at above meeting.

**Public Health Nurses**—Thirty-five (35) public health nurses have served under the law.

**County Nurses**—Four (4); served in Teton, Silver Bow, Yellowstone and Musselshell Counties.

**School Nurses**—Nineteen (19); served in Butte, Helena, Roundup, Miles City, Bozeman, Billings, Great Falls, Anaconda and Lewistown.

**Municipal Nurses**—Three (3); served in Cut Bank, Helena and Conrad.

**Tuberculosis Nurses**—Eight (8); served in Butte, Great Falls and in Valley and Missoula Counties.

The school, county and community nurses have had the supervision of nearly thirty thousand (30,000) school children. An idea of their work may be obtained from a brief summary taken from their monthly reports:

Talks on hygiene and sanitation.....	510
Visits to schools .....	3,314
Follow-up visits in homes.....	5,779

During the epidemic of scarlet fever and diphtheria which occurred in Montana in the Fall of 1917, by the services of these nurses many of the schools were kept open and the children kept under close supervision by daily inspection. Physicians and the public conceded these nurses to be important agents in combating and controlling the spread of the epidemic. By the inspection work in the schools a large percentage of children have been found suffering from physical defects and the follow-up work of the nurses has resulted in a large number of these children receiving corrective treatment.

Under the Selective Draft Act examinations have shown that nearly one-third of the young men of the Nation have grown up with physical handicaps, and from Government reports we are informed that a large proportion of these defects date from childhood when they could easily have been corrected. With these facts before us we are the more deeply impressed with the importance of public health nurses as health agents and have devoted considerable effort in cooperating with the Federal Bureau in forwarding the campaign for more extensive employment of county, school and all public health nurses.

In compliance with Section 6, of the Law, report blanks were prepared and supplied to all county, school and public health nurses. We have also distributed to such nurses literature and late publications in order that they may keep informed on advanced methods in public health nursing.

Under Section 2, of the Law, the duties of this Division are defined as: (a) To carry on a campaign of public health education, and, (b) To take all possible steps for the better protection of the health of the children of the State.

### (a) CAMPAIGN OF EDUCATION

This has been carried on by the distribution of literature; by the use of popular exhibit material, lectures, talks and demonstrations. **Literature**—Pamphlets have been sent from this office as follows:

Miscellaneous Health Subjects.....	18,314
Infant Care .....	15,600
Prenatal Care .....	1,000
Instructions for Child Health Conferences.....	1,500
Weighing and Measuring Test Cards.....	25,000
Press Letters and Circular Letters.....	3,000

(The bulletins on Infant Care and Prenatal Care have been furnished by the Federal Children's Bureau and through their generosity

franked from our office, the one on Infant Care being sent each month to the mother of every child whose birth has been recorded since November, 1917. This serves the double purpose of placing an authoritative text on child care in the hands of mothers and also of improving birth registration).

**Publications**—Infantile Paralysis—Child Welfare Bulletin No. 1.

Scarlet Fever—Child Welfare Bulletin No. 2. (This Bulletin gave the regulations for the prevention of the spread of infectious diseases and duration of quarantine and has proved of especial value for use in public schools).

Care of Children in War Time—Child Welfare Bulletin No. 3.

**Exhibits**—Consists of posters, model baby clothes and patterns, lantern slides on the care of babies, oral hygiene, school hygiene and a pure milk supply; also a washable doll for the demonstration of baby care. This exhibit material has been used at a great number of conferences in rural districts, also at State and County Fairs, and has been loaned for use in schools and also to the Government for the Indian Fairs on the Reservations.

**Lectures**—Lectures and illustrated talks have been given by the Director before Parent-Teachers' Associations, Woman's Clubs, Student Nurse classes, city and rural schools. Special lecturers have been secured for many meetings through the generosity of the Federal Children's Bureau and the County Nursing Associations. Of these speakers, those who have given inspiration to the work in this State may be mentioned Mrs. Mary Breckenridge Thompson on "Child Welfare" and Miss Adda Eldredge on "Public Health Nursing."

**(b) PROTECTION OF THE HEALTH OF THE CHILDREN  
OF THE STATE**

**Infantile Paralysis**—After this dread disease appeared in Montana in 1916 active steps were taken by the Legislature and an appropriation made for the Board of Health to combat its spread and start reconstruction work. Forty-nine (49) cases have been reported to the State Board of Health since that time. In each community where the disease occurred an investigation was made and individual instruction given on care and quarantine. In Billings and surrounding districts a large number of cripples were left from this disease. We recommended securing an especially trained agent to treat these cases. The Health Department of Yellowstone County and the Woman's Club of Billings acting upon this recommendation, secured Miss Marian Fox, trained in the reconstruction work at the Children's Hospital in Boston, under Dr. R. W. Lovett. When the appropriation made for this work by the local authorities at Billings was exhausted, Miss Fox's services were continued and her salary paid out of State Funds. This work has given very satisfactory results and many of the cripples have been greatly benefited. During the State Fair held in Helena,

September 9 to 14, Miss Fox held conferences here in order to give the parents of the State an opportunity to bring their children for examination and consultation.

**Cooperation**—The Child Welfare Division has secured valuable assistance in its work from the Parent-Teachers' Association, Woman's Clubs, Child Welfare Association, Montana Association for the Prevention of Tuberculosis, Boards of Education, Health Officers, Home Demonstration Agents of the Extension Division of the State Agricultural College and the Federal Children's Bureau.

During the stress of war time the Federal Children's Bureau put on a special program for the Nation for the conservation of child life. This work was carried on through the Woman's Committee of the Council of Defense and, through which was effected a strong organization throughout our State, and we appreciate the splendid work of the State Chairman of the Woman's Committee and of the County Chairman throughout Montana. Through their efforts the child welfare work has been and will be accomplishing results in the health of the next generation of citizens.

The last three months of 1918 the child welfare program has been at a standstill and all the resources of the office have been used in combating the epidemic of influenza.

### RECOMMENDATIONS

1. We believe it important to provide training for public health nurses. The public appreciates the value of such agents in the conservation of health so that the demand for well qualified nurses for this work far exceeds the number of women prepared to hold such positions. It would be practical for the Board of Health, through the Child Welfare Division, to encourage the establishment of training centers where lectures and field work could be given student and graduate nurses, in order that they might gain the theory and experience necessary for this branch of service.

2. The campaign of education must be extended in the rural districts. It has been shown that the exhibits and lectures make a strong appeal to these people and more of the smaller towns and villages should be reached this coming year. The extension of Child Health Conference should be encouraged.

3. Efforts should be made to reduce the number of stillbirths and the high rate of infant mortality in the first month of life, by prenatal care and instruction. The loss in Montana of potential citizen life is high. To each 84.5 babies living at three months of age, there has been lost 15.5 through death and stillbirths. Nursing organizations and visiting nurses should include this activity as part of their general routine work. There is great need for more thorough and systematic work along these lines. The formation of Mothercraft classes in the schools and through other organizations would be a step in training the future mothers of the State in the care of the child.

Respectfully submitted,

MARGARET HUGHES,  
Director.

## HYGIENIC LABORATORY

---

During the year 1917 the State Board of Health laboratory was reorganized and Dr. A. H. McCray was appointed Director.

This Laboratory was inspected and passed upon by the United States Public Health Service, and through the co-operation of this Service is now prepared to give the Pasteur Treatment. No cases of human rabies have yet occurred in the State of Montana, but on account of the fact that this disease has made its appearance in coyotes in one section of the State, it will probably be only a matter of time before this disease appears in humans. The State Board of Health is prepared to treat the first case that occurs.

The Laboratory is at the service of the doctors of the State and makes free Wassermans as well as ordinary routine work. The Director's report follows:

DEPARTMENT OF PUBLIC HEALTH  
STATE OF MONTANA

W. F. Cogswell, M. D., Secretary  
Helena

HYGIENIC LABORATORY

A. H. McCray, M. D.  
Director

Dr. W. F. Cogswell, Secretary,  
State Board of Health,  
Helena, Montana.

Dear Dr. Cogswell:

I beg to submit the following report upon the work done during the past year in the State Hygienic Laboratory, together with suggestions for the extension of the work of the Laboratory for the coming year.

The Laboratory was formally opened at Helena on October 15, 1917, but some examinations, four in all, were made previously to the 15th. From October 1, 1917 to October 1, 1918, a total of 1322 specimens have been examined. The examinations have embraced mostly the following material:

Cultures for the presence of the organism of diphtheria; sputum for the presence of the organism of tuberculosis; blood for the widal test in typhoid fever; blood for the Wassermann test for syphilis; brains of various animals for evidence of rabies; tissue for microscopical examination for tumor diagnosis; spinal fluid for evidences of Cerebro-spinal-meningitis or tuberculosis; various kinds

of material for the presence of germs of anthrax or tetanus; discharges for evidences of gonorrhoea; blood for blackleg determination; pus or tissue for the presence of actinomyces; pus, exudates, and body fluids for the presence of disease producing organisms, and a smaller miscellaneous list of various specimens for evidences of various diseases.

Of the preceding list of specimens received for examination the following make up the greater portion, viz: cultures for diphtheria determination; blood for the Widal test in typhoid fever; blood for the Wassermann test in syphilis; sputum to be examined for the presence of tuberculosis; tissue for microscopical examination in tumor determination; discharges for evidences of gonorrhoea, and smears of pus, blood or tissue juices for miscellaneous disease producing germs. A tabulated list of the more important examinations is attached as a part of this report.

It will be seen that in total number of examinations those for diphtheria head the list with a total of 560 of which 134 were positive for the presence of *Bacillus diphtheria*. The Laboratory prepares all of the culture media for making examinations for diphtheria determination, and distributes it to health officers and physicians of the State. The above does not represent the total number of diphtheria examinations for which the Laboratory is responsible, since a large number of the cultures for which outfits were furnished by the Laboratory have been examined by physicians and health officers in their own laboratories. The Laboratory is prepared to furnish such culture outfits in large numbers to physicians wishing to make throat swabs on a large scale, as in schools or institutions where "carriers" are suspected.

The Widal blood test for aid in typhoid fever determination comes next on the list in number of examinations made, with a total of 301 of which 62 gave a positive reaction.

Next in order of importance relative to number of specimens examined is sputum for the presence of *B. tuberculosis* with a total of 128, of which 30 were positive.

The Wassermann blood test for syphilis comes next with a total of 116 of which 34 were positive. It was not until July that notice was given the physicians of the State that the test would be performed, so that the figures above represent practically the number of examinations for three months only. This test bids fair to take precedence over all others in point of numbers, and deservedly so in view of the extensive campaign being made for the eradication of venereal diseases.

The sectioning of tissue for microscopical examination for tumor determination was also undertaken by the Laboratory. A total of 36 specimens was received for this purpose. The tissue is prepared and returned to the physician for his examination.

The number of examinations made for evidences of *Micrococcus gonorrhoea* totals 27 with 5 positive specimens. These will probably increase along with the blood examinations for syphilis the coming year.

The Laboratory has been inspected and approved by an agent of the U. S. Public Health Service for giving the Pasteur treatment for rabies. No rabies has been reported in the State, but it is reported as being prevalent in adjoining states, notably among the coyotes in Idaho. It is not unlikely that the disease will manifest itself in Montana, nor is it unlikely that it is already present, as coyotes have been reported as making vicious, unwarranted attacks on individuals in certain parts of the State. It is hoped that persons having reason to suspect rabies in any animal will take steps to ship the brain to the Laboratory for examination, after having packed the same in ice, in order to preserve the brain in as perfect a condition as possible.

At the outbreak of the epidemic of influenza, the Director of the Laboratory was sent by the State to the Mayo Clinic at Rochester, Minnesota, to study the results of the anti-influenza and anti-pneumonia vaccine being prepared by Dr. E. C. Rosenow. As a result of this visit 38 liters of vaccine, sufficient for over 12,500 complete adult treatments have already been received, and distributed gratis to the physicians of the State. The results of this vaccine in immunizing against the fatal complications following influenza have been very encouraging.

The amount of material in all which has been examined in the first year's existence of the Laboratory is considered very encouraging. It seems especially good for such a year as the past one in which so many physicians have left the State for military service.

It is believed that in a State so large as Montana that one Laboratory, even tho centrally located cannot render the best service. A number of branch laboratories under the jurisdiction of the central Laboratory in Helena would more adequately meet the needs of such a large territory. Many states are adopting the plan one central laboratory, with branch laboratories at convenient points over the state, and find that this plan more efficiently serves the people through the physicians and health officers of the state. With only one laboratory a report upon a laboratory diagnosis especially in certain of the acute infectious diseases is often so long delayed that it is of little value. Notable examples of diseases in which early laboratory confirmation is desirable and even necessary to be of value in aiding in treatment are, diphtheria, typhoid fever, and rabies. Most physicians at the present time depend upon laboratory aid to guide them in treatment, and the State owes it to the public to grant such aid and in most efficient form. It is recommended that the plan of establishing branch laboratories be kept in view and adopted as soon as possible, the usefulness of the laboratory would be increased many fold if this were done.

The Laboratory has been housed the past year in the restaurant building on the Capitol grounds. Owing to the meeting of the State Legislature this year, the restaurant building will be needed for the purpose for which it was built, and the Laboratory will be obliged to seek other quarters, temporarily at least. The moving of a Laboratory entails much labor with consequent loss of time, and

also there is a material reduction of efficiency in the work of the Laboratory. Both of these conditions are undesirable and to be avoided in the future if possible, and to gain the utmost efficiency for the Laboratory, I would recommend that steps be taken at the earliest possible moment to secure adequate permanent quarters.

During the past year the Director of the Laboratory has performed all of the work of the Laboratory unassisted. It is strongly recommended that the force of the Laboratory be increased the coming year. This will give opportunity for the undertaking of new lines of work, and also permit the further development of the work already undertaken.

As you are aware the Live Stock Sanitary Board, through Dr. Butler, the State Veterinarian, has very kindly permitted us to use their laboratory equipment the past year. With the completion of the new Live Stock Building they will, however, require all of their equipment, so that the Hygienic Laboratory must needs purchase considerable new equipment. I have submitted to you previously a list upon which I have received a quotation from one of the leading firms dealing in apparatus of this character. A very conservative estimate of the cost of the equipment necessary would be approximately \$1,800.00. Without these supplies the Laboratory could not proceed, and I trust that the funds for the purchase of the same will be available soon.

Yours very truly,

A. H. McCRAY, M. D.,  
Director.

	Diph.		Widal		Sputa		Tissue Section- ing	Wasser		Rabbies Total
	Total	Pos	Total	Pos	Total	Pos	Total	Pos	Total	Pos
1917:										
October .....	7	2	15	2	6	1				1
November .....	40	12	36	11	12	6				
December .....	58	15	13	1	10	2	6			
1918:										
January .....	220	38	21	7	9	1	1			
February .....	79	23	13	3	7	3	5			
March .....	26	9	24	3	11	3	4	1		
April .....	55	20	30	5	15	2				1
May .....	34	9	16	1	8	4	2	1	1	2
June .....	14	3	27	5	12	4	11	2	2	
July .....	20	1	33	4	17	1	3	16	3	
August .....			36	6	12	2	1	27	4	
September .....	7	2	37	14	9	1	3	69	24	
	560	134	301	62	128	30	36	116	34	4

A. H. McCRAY.

	Spinal Fluid		Urine of Smear for Gonorrhoea		Smears General		Anthrax		Tetanus		Blackleg		Actinomycosis	
	Total.....	Pos.....	Total.....	Pos.....	Total.....	Pos.....	Total.....	Pos.....	Total.....	Pos.....	Total.....	Pos.....	Total.....	Pos.....
1917:														
October .....	1	1	1	0	1		1	0						
November .....			4	2	1				2					
December .....			1	0	1				2		4			
1918:														
January .....	2	0	3	0	1		1	1						
February .....			4	1	2								2	0
March .....			2	0			2	0	1		1			
April .....	2	0			1		2	0	1					
May .....											1			
June .....			4	0										
July .....			1	0	6									
August .....	1	0	3	2							1			
September .....			4	0										
Total .....	6	1	27	5	13		6	1	6		7		2	0

## VENERAL DISEASE DIVISION

---

At a meeting of the State Board of Health, held August 26, 1918, a Division of Venereal Diseases was created. F. J. O'Donnell, who had been appointed as Scientific Assistant in the United States Public Health Service, was put in charge of this Division. The funds for maintaining the Division during the first year of its operation are provided by the United States Public Health Service. If this Division is to be continued the State must appropriate an equal amount to that furnished by the United States Public Health Service, namely \$4,088.75.

A report of the Director of this Division follows:

DEPARTMENT OF PUBLIC HEALTH  
Division of Venereal Diseases

Helena, Dec. 31, 1919.

Dr. W. F. Cogswell,  
Secretary State Board of Health,  
Helena, Montana.

Dear Sir:

I am herewith submitting report of the Division of Venereal Diseases, for the period of August 26, 1918, the date on which this Division was created, to January 1, 1919.

Respectfully yours,

F. J. O'DONNELL,  
Director.

The reports of the Draft Boards and the data made public by the Surgeons General of the Army, Navy and Public Health Service relative to the prevalence of venereal diseases in our armed forces revealed for the first time the menacing seriousness of the venereal disease problem in this country. Our military authorities being familiar with the terrible price the European armies had paid the first years of the War because of attempting to evade this question, threw aside evasion and prudery and with determination, science and medical skill, attacked venereal diseases directly, with the result that the venereal disease rate in our Army was lowered below that of any Army of any Nation in the history of the world. In spite of this record, however, from September, 1917 to November, 1918, there was 197,391 cases of venereal diseases in our Army in the United States. According to the estimates of the Surgeon General of the Army, one man contracted venereal disease after entering the service, to five men before entering it. This fact brings home the truth that these diseases form a public health problem for each state,

county and city to solve. This is no easy task but is a fight worthy of our best energies and our best efforts. Failure to meet this problem fairly and squarely, is a crime not only to ourselves but to future generations.

The United States Public Health Service has taken the initiative in a nation-wide campaign for the control and prevention of venereal diseases. Each state has been asked to cooperate, through its Health Department to make this campaign a success.

Early in 1918 it became apparent to the State Board of Health that if Montana was to do her share in this important work, it would be necessary to enlist the aid of all City and County officials, lodges, societies, commercial clubs, chambers of commerce and other public bodies. With this fact in view, the Secretary of the State Board of Health, appealed to the Surgeon General of the United States Public Health Service for the services of an experienced lecturer. In response to this appeal, Lieut. Col. G. M. Magruder was detailed to take up the work in this State. Col. Magruder very materially assisted the State Board of Health in organizing and outlining a plan of campaign and rendered valuable aid in arousing sentiment favorable to the establishment of clinics and isolation hospitals for the care and treatment of venereally infected persons.

The following report to the Surgeon General of the United States Public Health Service will indicate to some extent the activities of Col. Magruder while in this State:

Helena, Mont., Sept. 22, 1918.

Surgeon General,  
U. S. Public Health Service,  
Washington, D. C.

Dear Sir:

In obedience to your order of June 10th, directing me to proceed to Helena, Montana, relative to venereal disease control in that State, I have the honor to state that I reached Helena on July 4th, and ever since that time have been engaged in the above work.

I have visited the following cities: Helena, Butte, Bozeman, Livingston, Big Timber, Billings, Glendive, Miles City, Roundup, Missoula, Ravalli, Polson, Kalispell, Glasgow, Havre, Great Falls, Deer Lodge, Anaconda, Dillon and Lewistown, Terry and Sidney.

The State Health Officer, Dr. W. F. Cogswell, who takes great interest in the work, has accompanied me on most of these visits and in other instances a representative from his office, Mr. F. J. O'Donnell, who has been appointed Scientific Assistant by the Bureau, has been present.

All the above named cities cooperating with the counties in which they are located have agreed without hesitation or question to establish isolation hospitals for the detention of venereal cases. In most

instances several counties have combined to use the same detention hospital in order to diminish the expense. In addition, Helena, Butte, Billings and Great Falls, the largest cities in the State, have agreed to establish venereal clinics.

In most instances the patient will be cared for by city or county health officers, but in some cases a special physician will be employed for this work.

The State Board of Health has adopted with slight modifications the regulations proposed by the three surgeons general, which went into effect the first of September. A copy of these regulations is enclosed. Owing to the date on which they went into effect reports have not yet been received relative to the number of patient confined.

1. Educational: About 37 lectures have been delivered by me to Rotary Clubs, Commercial Clubs, Medical Societies, Knights of Pythias, Grand Lodge of Masons, Knights of Columbus, Dental Societies, Societies for State Health Officers, and organizations, and in addition numerous informal talks have been made to city councils and county commissioners.

I have personally interviewed the editors of different newspapers of the State, and secured their cooperation, and all of the daily papers, some 13 in number and about 200 weekly papers have agreed to publish once a week an article dealing with the matter in hand.

Dr. E. O. Sisson, president of the University of Montana, who is much interested in this work, and who carries weight throughout the State, has agreed to take charge of the publicity department. He will furnish articles once a week to be released on Tuesday for publication in the above papers.

Publicity will be further secured by posting framed notices in public buildings, hotels, etc., and in addition a large number of small notices unframed on account of expense will be similarly posted.

2. Law Enforcement: The regulations have gone into effect so recently (September 1st) that no reports have been as yet received in regard to the number of persons who have been detained.

The buildings to be occupied will in the main be county and city hospitals, though in some instances additional buildings will be erected.

The Scientific Assistant has visited several counties in order to secure their cooperation in combination with the neighboring cities and has met with excellent success. He will continue this work until the whole state is covered, visiting those counties and villages which in my limited time I was forced to omit.

This State is very large, and the distances great, and the train service not especially convenient, so that considerable time will be required to cover it all. And owing to the fact that I have had to visit some cities more than once, and one city as many as six times, in order to appear before different organizations, a great deal of travel has been necessitated and time lost.

3. Propaganda for Providing Detention Hospitals and Clinics: Funds for providing detention hospitals and clinics will be supplied

in most instances by the counties as they are most abundantly supplied. In some cases cities share the expense, and where several counties combine the expenditure will be equally divided among them.

4. Facilities for Early Diagnosis and Treatment: The State Health Office is prepared to examine free of charge, slides and blood specimens for early diagnosis and treatment. The State Health Office has also had published for free distribution a large number of pamphlets on social hygiene and sex matters which will be of great aid.

In concluding the work here I wish to say that my reception everywhere has been most gratifying, and not a single city or county has raised any objection to carrying out the proposed regulations or has questioned the necessity therefor. They have taken up directly the question of raising funds, and providing facilities for the work proposed, and I am much gratified with the results which have apparently been accomplished. Time alone will show with how much thoroughness these promises are put into effect.

Scientific Assistant O'Donnell is young, active and interested in the work, and I believe will give his best effort to its successful consummation. Upon his follow up work will depend in a large measure the success of the campaign.

Respectfully,

(Signed) G. M. MAGRUDER,  
Senior Surgeon, U. S. P. H. S.

P. S. Have just visited Billings and am told that 26 prostitutes are under arrest and undergoing examination by the Health Officer.

G. M. G.

In addition to the lectures mentioned in the above report, the writer arranged for meetings with and gave informal talks to County Commissioners, City officials and businessmen of Toole, Hill, Blaine, Phillips, Valley and Sheridan Counties. Cooperation was promised in every instance.

Regulations as proposed by the Surgeon General of the Army, Navy, and Public Health Service were, with slight modification, adopted at a special meeting of the State Board of Health on July 20, 1918. These regulations are as follows:

Regulation 117. Venereal Diseases Declared Dangerous to the Public Health—Syphilis, gonorrhea and chancroid, hereinafter designated venereal diseases, are hereby declared to be contagious, infectious, communicable and dangerous to public health.

Regulation 118. Venereal Diseases to be Reported—Any physician or other person who makes a diagnosis in, or treats a case of syphilis, gonorrhea, or chancroid, and every superintendent or manager of a hospital dispensary, or charitable or penal institution, in which there is a case of venereal disease, shall report such case immediately in writing to the Local or County Health Officer, stating the name and address or the office number, age, sex, color, and occupation, of the diseased person and the date of onset of the disease, and the

probable source of the infection, provided, that the name and address of the diseased person need not be stated except as hereinafter specifically required. The report shall be enclosed in a sealed envelope and sent to the Local or County Health Officer, who shall report weekly on the prescribed form to the State Board of Health, all cases reported to him.

Regulation 119. Patients to Be Given Information—It shall be the duty of every physician and every other person who examines or treats a person having syphilis, gonorrhea or chancroid, to instruct such person in measures for preventing the spread of such diseases, and inform such person of the necessity of treatment until cured, and to hand such person a copy of the circular of information obtainable for this purpose from the State Board of Health.

Regulation 120. Investigation of Cases—All Local and County Health Officers shall use every available means to ascertain the existence of and to investigate, all cases of syphilis, gonorrhea, and chancroid within their several territorial jurisdictions, and to ascertain the sources of such infections. Local and County Officers are hereby empowered and directed to make such examination of persons reasonably suspected of having syphilis, gonorrhea, or chancroid, as may be necessary for carrying out these regulations. Owing to the prevalence of such diseases among prostitutes and persons associated with them, all such persons are to be considered within the above class.

Regulation 121. Protection of Others From Infection by Venereally Diseased Persons—Upon receipt of a report of a class of venereal disease it shall be the duty of the Local or County Health Officer to institute measures for the protection of other persons from infection by such venereally diseased person.

(a) Local and County Health Officers are authorized and directed to quarantine persons who have, or who after examination are reasonably suspected of having syphilis, gonorrhea, or chancroid, whenever, in the opinion of said Local or County Health Officer, or the State Board of Health, or its Secretary, quarantine is necessary for the protection of the public health. In establishing quarantine the health officer shall designate and define the limits of the area in which the person known to have, or reasonably suspected of having syphilis, gonorrhea, or chancroid and his or her immediate attendant are to be quarantined and no person other than the attending physician shall enter or leave the area of quarantine without the permission of the Local or County Health Officer.

No one but the Local, County or State Health Officer shall terminate said quarantine, and this shall not be done until the diseased person has become noninfectious, as determined by the Local, County or State Health Officer or his authorized deputy through the clinical examination and necessary laboratory tests, or until permission has been given by the State Board of Health or its Secretary.

(b) The health officer having jurisdiction shall inform all persons who are about to be released from quarantine for venereal disease, in case they are not cured, what further treatment should

be taken to complete their cure. And said health officer must receive from each patient proper assurance that treatment will be continued and must be given the name and address of the physician who is to continue the treatment. Said physician also must report immediately the fact that the patient is under his care and the date on which said patient discontinues treatment. The name of the patient being given in each case.

Regulation 122. Conditions Under Which the Name of a Patient Is Required to Be Reported—(a) When a person applies to a physician or other person for the diagnosis or treatment of syphilis, gonorrhea, or chancroid, it shall be the duty of the physician or person so consulted to inquire of and ascertain from the person seeking such diagnosis or treatment whether such person has theretofore consulted with or has been treated by any other physician or person and, if so, to ascertain the name and address of the physician or person last consulted. It shall be the duty of the applicant for diagnosis or treatment to furnish this information, and a refusal to do so or a falsification of the name and address of such physician or person consulted by such applicant shall be deemed a violation of these regulations. It shall be the duty of the physician or other person whom the applicant consults to notify the physician or other person last consulted of the change of advisers. Should the physician or person previously consulted fail to receive such notice within ten days after the last date upon which the patient was instructed by him to appear, it shall be the duty of such physician or person to report to the Local or County Health Officer the name and address of such venereally diseased person.

(b) If an attending physician or other person knows or has good reason to suspect that a person having syphilis, gonorrhea, or chancroid is so conducting himself or herself as to expose other persons to infection, or is about so to conduct himself or herself, he shall notify the Local or County Health Officer of the name and address of the diseased person and the essential facts in the case.

Regulation 123. Druggists Forbidden to Prescribe for Venereal Diseases—No druggist or other person not a physician licensed under the laws of the State shall prescribe or recommend to any person any drug, medicine, or other substances to be used for the cure or alleviation of gonorrhea, syphilis, or chancroid, or shall compound any drugs or medicines other than proprietary for said purpose from any written formula or order not written for the person for whom the drugs or medicines are compounded and not signed by a physician licensed under the laws of the State. All druggists are required to keep a record of the names and addresses of all persons to whom proprietary or patent medicines, commonly or presumably used in the treatment of venereal diseases, are sold or supplied to, and shall forward a report to the proper health officer at the end of each week, giving the names and addresses of such persons and the remedy sold in each case.

Regulation 124. Spread of Venereal Disease Unlawful—It shall be a violation of these regulations for any infected person knowingly

to expose another person to infection with any of the said venereal diseases or for any person to perform an act which exposes another person to infection with venereal disease.

Regulation 125. Prostitution to Be Repressed—Prostitution is hereby declared to be a prolific source of syphilis, gonorrhea, and chancroid, and the repression of prostitution is declared to be a public health measure. All Local and County Health Officers are therefore directed to cooperate with the proper officers whose duty it is to enforce laws directed against prostitution and otherwise to use every proper means for the repression of prostitution.

Regulation 126. Giving Certificates of Freedom From Venereal Diseases Prohibited—Physicians, health officers, and all other persons are prohibited from issuing certificates of freedom from venereal disease, providing this rule shall not prevent the issuance of necessary statements of freedom from infectious diseases written in such form or given under such safeguards that their use in solicitation for sexual intercourse would be impossible. Such certificates shall not be used or exhibited for solicitation for immoral purposes.

Regulation 127. Records to Be Secret—All information and reports concerning persons infected with venereal diseases shall be inaccessible to the public except, in so far as publicity may attend the performance of the duties imposed by these regulations and by the laws of the State.

Regulation 128. These regulations shall be in full force and effect on and after September 1, 1918.

These regulations have received the endorsement of the Montana State Health Officers' Association, State Medical Association and the Montana State Pharmaceutical Association.

In order to properly enforce these regulations a Division of Venereal Diseases was created as a special meeting of the State Board of Health held on August 26, 1918. From the time these regulations became effective, September 1, 1918, to January 1, 1919, there were 497 cases of venereal diseases reported to this Division. These cases are classified by months, as follows:

### Gonorrhea and Syphilis Reported to January 1, 1919.

#### GONORRHEA.

	August		September		October		November		December		Totals
	F	M	M	F	M	F	M	F	M	F	
			153	20	77	3	31	2	29	1	
Total .....			173		81		31		30		330

#### SYPHILIS.

		5	53	51	29	4	26	2	8	4	
Total .....		5	104		33		28		12		177

By October 1, 1918, arrangements were under way or practically completed in every County in the State for the establishment of isolation hospitals for the care and treatment of all venereally infected persons, who were unable or unwilling to care for themselves.

At about this time, however, the epidemic of Spanish Influenza spread over the State and because of the scarcity of medical men, Local and County Health Departments were disorganized and the work was practically suspended for the time being.

Through the efforts of the Secretary of the State Board of Health, the State Council of Defense appropriated \$1000.00 to aid in the venereal disease campaign. This money was used for educational purposes and for printing the initial supply of report forms. Forty-Two Thousand educational pamphlets, approved by the United States Public Health Service, were printed and approximately one-half of this number has already been distributed. These pamphlets are listed for distribution in sets as follows:

**Set A—For Young Men**

2. A reasonable Sex Life for Men.
7. Sexual Hygiene for Young Men.
8. Vigorous Manhood.
4. Smash the Line (The case against the restricted district).

**Set B—For Public Officers and Business Men**

1. Public Health Measures in Relation to Venereal Diseases.
3. Venereal Diseases—A Sociologic Study.
4. Smash the Line.
5. The Need of Sex Education.
6. A State-Wide Program for Sex Education.

**Set C—For Boys**

8. Vigorous Manhood. (Especially for boys 12 years of age and over).

Note—For boys under 12, see Pamphlet No. 9 (Set D), Portions of No. 8 also may be read to younger boys. Boys 15 years and over may be given pamphlet No. 2 (See Set A) at the discretion of the parent.

7. Sexual Hygiene for Young Men.

**Set D—For Parents**

9. When and How to Tell the Children.
3. Venereal Diseases—A Sociologic Study.
5. The Need of Sex Education.

**Set E—For Girls and Young Women**

10. Womanhood. (Especially for girls 11 years of age and over).

Note—For girls under 11, see pamphlet No. 9 (Set D), Portions of No. 10 also may be read to younger girls. Girls 15 and over may be given pamphlet No. 11 at the discretion of the parent.

11. Marriage and Motherhood.

**Set F—For Teachers**

12. The School Teacher and Sex Education.
13. Sex Education in the Home and High School.
3. Venereal Diseases—A Sociologic Study.
4. Smash the Line.
5. The Need of Sex Education.

The Sixty-Fifth Congress by the Chamberlain-Kahn Act, appropriated the sum of One Million Dollars, to be paid to the various states for the use of their Boards or Health Departments, for the prevention, control and treatment of venereal diseases.

The sum allotted to each state being based upon the 1910 population. Under the provisions of this Act, Montana received \$4088.76, for the fiscal year 1919. This allotment was not conditioned upon the State appropriating an equal amount but is given with the one stipulation that the funds be disbursed in accordance with the rules and regulations prescribed by the Secretary of the Treasury. Like amounts are available for the fiscal years 1920 and 1921, conditioned, however, that for each dollar allotted to the State, the State shall specifically appropriate or set aside, an equal amount for the prevention, control and treatment of venereal diseases.

Legislation now pending will, if enacted, meet the conditions of the Federal Department, thus Montana will be able to carry on this work in an effective manner.

There is also pending other legislation, bearing upon this subject, which will help very materially to carry on this campaign.

The very excellent work being done in Billings and Yellowstone County for the control and suppression of venereal diseases is deserving a special mention. Dr. L. W. Allard, who is in charge of the health work in Billings is the only whole time health officer in the State and through

his efforts a free clinic and isolation hospital have been established. Fifty-seven patients have received, or are receiving treatment at this establishment.

The County Commissioners of Silver Bow County have also taken a great deal of interest in this work and have employed a physician to take care of venereally diseased persons and have at some considerable expense, arranged for the equipment of a clinic and the establishment of an isolation hospital.

---

### LICENSED EMBALMERS

Under the direction of the State Board of Health the regular examinations for candidates wishing to secure embalmers licenses are held in April and October. During the past two years sixty licenses have been granted.

---

### SCHOOL BUILDINGS

The law requires that all plans for new school buildings must be submitted to the State Board of Health for its approval. During the two years 227 plans have been examined and approved.

The State Board of Health wishes to express its appreciation of the very great assistance that the Superintendent of Public Instruction has given in the examination of these plans.

---

### VITAL STATISTICS

The law requires that the State Board of Health gather and file the vital statistics for the State of Montana, but no special appropriation has been made for this work. We feel that we are getting fairly complete records of deaths, but our birth records are not satisfactory. A Division of Vital Statistics should be created and a competent statistician put in charge.

The record of deaths for 1916 and 1917 will be found in the tables which follow.

DEATHS (EXCLUSIVE OF STILLBIRTHS) REPORTED TO THE STATE  
1917. ARRANGED ACCORDING TO COUNTIES,

TABLE NO. 1.

JANUARY

	Anterior Polomyelitis.....		Meningitis .....		Typhoid Fever .....		Measles .....		Scarlet Fever .....		Diphtheria .....		Tuberculosis .....		Smallpox .....		Spotted Fever.....	
Year .....	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17
Beaverhead .....																		
Big Horn .....																		
Blaine .....																		
Broadwater .....																		
Carbon .....					1			1										
Cascade Excl. of .....									1									
Great Falls .....			4	2														
Chouteau .....														1				
Custer .....					1	1												
Dawson .....																		
Deer Lodge Excl. of .....					5	7												
Aanconda .....					1	3												
Fallon .....																		
Fergus .....					3	2												
Flathead Excl. of .....					2	2												
Kalispell .....																		
Gallatin Excl. of .....																		
Bozeman .....																		
Granite .....					1													
Hill .....																		
Jefferson .....																		
Lewis & C. Excl. of .....						1												
Helena .....					1	1												
Lincoln .....						1												
Madison .....						1												
Meagher .....																		
Mineral .....								1										
Missoula Excl. of .....					1													
Missoula City .....					4	2												
Musselshell .....					1	1												
Park Excl. of .....					1													
Livingston .....																		
Phillips .....						1												
Powell .....																		
Prairie .....																		
Ravalli .....						1												
Richland .....																		
Rosebud .....						1												
Sanders .....																		
Sheridan .....					1	1												
Silver Bow Excl. of .....					5	12												
Butte .....					5	9												
Stillwater .....								2										
Sweet Grass .....																		
Teton .....																		
Toole .....																		
Valley .....						1												
Wibaux .....																		
Yellowstone Excl. of .....																		
Billings .....						1												
TOTALS .....					37	50	1	2	3	2	2		4	8	3			

BOARD OF HEALTH FOR THE TWO YEARS ENDING DECEMBER 31,  
PRINCIPAL CITIES, AND PRINCIPAL CAUSES.

TABLE NO. 1.

JANUARY

[illegible]

TABLE NO. 1—Continued.

FEBRUARY

	Anterior Polomyelitis.....			Meningitis .....			Typhoid Fever .....			Measles .....			Scarlet Fever .....			Diphtheria .....			Tuberculosis .....			Smallpox .....			Spotted Fever.....		
Year .....	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17			
Beaverhead .....																											
Big Horn .....						2																					
Blaine .....																											
Broadwater .....																											
Carbon .....						1																					
Cascade Excl. of .....						1																					
Great Falls .....					1	1																					
Chouteau .....																											
Custer .....																											
Dawson .....					1																						
Deer Lodge Excl. of .....						2																					
Anaconda .....																											
Fallon .....																											
Fergus .....						4																					
Flathead Excl. of .....					3	1																					
Kalispell .....						1																					
Gallatin Excl. of .....						2																					
Bozeman .....																											
Granite .....																											
Hill .....						1																					
Jefferson .....																											
Lewis & C. Excl. of .....																											
Helena .....																											
Lincoln .....						2																					
Madison .....																											
Meagher .....																											
Mineral .....																											
Missoula Excl. of .....						1																					
Missoula City .....						1																					
Musselshell .....						1	2																				
Park Excl. of .....						1																					
Livingston .....																											
Phillips .....																											
Powell .....																											
Prairie .....																											
Ravalli .....																											
Richland .....																											
Rosebud .....																											
Sanders .....						1																					
Sheridan .....						2																					
Silver Bow Excl. of .....						4	6																				
Butte .....						10	9																				
Stillwater .....																											
Sweet Grass .....																											
Teton .....																											
Toole .....																											
Valley .....							1																				
Wibaux .....																											
Yellowstone Excl. of .....																											
Billings .....						1	2																				
TOTALS .....						26	40																				

TABLE NO. 1—Continued.

## FEBRUARY

Totals	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17
All Other Causes	2	1	2	1	3	4	3	3	4	8	4	4	2	2	7	10	3	15	5	3	2	2
Alcoholism	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Suicide	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Violence	2	3	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Acute Intestinal Diseases	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Malignant Tumors	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Organic Heart Disease	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Nephritis	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pneumonia	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Whooping Cough	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	3	11	58	91	28	38	42	65	26	24	16	59	47	8	12	7	5	143	175	412	547	

TABLE NO. 1—Continued.

MARCH

[illegible]







TABLE NO. 1—Continued.

MAY

	Anterior Polymyeltis.....		Meningitis .....		Typhoid Fever .....		Measles .....		Scarlet Fever .....		Diphtheria .....		Tuberculosis .....		Smallpox .....		Spotted Fever.....	
Year .....	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17
Beaverhead .....																		
Big Horn .....																		
Blaine .....																		
Broadwater .....																		
Carbon .....					1													
Cascade Excl. of .....					1	1												
Great Falls .....					1	1					1							
Chouteau .....											1							
Custer .....																		
Dawson .....	1																	
Deer Lodge Excl. of .....					5													
Anaconda .....					2				1									
Fallon .....																		
Fergus .....					1													
Flathead Excl. of .....					2	1				1								
Kalispell .....									1									
Gallatin Excl. of .....					1					1								
Bozeman .....																		
Granite .....																		
Hill .....					2	1												
Jefferson .....																		
Lewis & C. Excl. of .....																		
Helena .....		1			3	2												
Lincoln .....																		
Madison .....																		1
Meagher .....																		
Mineral .....																		
Missoula Excl. of .....					2	2												
Missoula City .....		1			1	2			3			1				1		
Musselshell .....					1													
Park Excl. of .....						1												
Livingston .....					1	1										1	1	
Phillips .....					1	1												
Powell .....																		
Prairie .....																		
Ravalli .....		1	3															
Richland .....						2												
Rosebud .....																	1	1
Sanders .....					1													
Sheridan .....					1	1												
Silver Bow Excl. of .....					2	10			1									
Butte .....					3	6	2										1	1
Stillwater .....																		
Sweet Grass .....																		
Teton .....						2											1	
Toole .....																		2
Valley .....						1												
Wibaux .....																		
Yellowstone Excl. of .....						2			1									
Billings .....					1	1				1							1	
Carter .....																		
Wheatland .....																		
TOTALS .....	2	5			23	46	3		4		6	4	8	3	11	4	9	3

TABLE NO. 1—Continued.

MAY

Totals		All Other Causes		Alcoholism		Suicide		Violence		Acute Intestinal Diseases		Malignant Tumors		Organic Heart Disease		Nephritis		Pneumonia		Whooping Cough	
16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17
10	8	3	5					3	1												
2	5	1	2					1	1												
4	5	4	4					1	1												
11	12	4	11					2	2												
7	1	2	7					3	3												
16	43	17	16					1	1												
4	10	3	4					1	1												
9	17	2	8					3	3												
12	11	3	3					1	1												
18	28	16	20					1	2												
9	21	8	9					2	2												
22	22	12	26					7	2												
13	13	3	3					1	2												
4	12	1	4					4	4												
5	5	2	1					1	1												
5	8	4	5					2	2												
1	2	1	2					1	1												
15	20	5	15					2	1												
4	4	2	2					1	1												
10	8	3	3					1	1												
15	13	3	15					2	2												
6	5	2	6					3	3												
7	7	2	2					1	1												
3	7	1	3					1	1												
2	3	1	2					2	2												
7	5	3	7					2	2												
4	4	1	4					3	3												
15	9	5	13					2	2												
8	17	8	8					1	1												
9	39	1	9					3	3												
1	1	1	1					1	1												
6	6	3	3					1	1												
11	10	4	11					4	5												
24	48	10	24					5	6												
79	79	83	79					1	2												
4	4	3	4					1	1												
6	1	5	6					1	1												
13	20	8	13					3	3												
1	1	3	1					2	2												
8	8	1	8					1	1												
25	25	11	22					4	3												
1	1																				
602	602	479	479					62	59												



TABLE NO. 1—Continued.

JUNE

[illegible]

TABLE NO. 1—Continued.

JULY

	Spotted Fever		Smallpox		Tuberculosis		Diphtheria		Scarlet Fever		Measles		Typhoid Fever		Meningitis		Anterior Polomyelitis	
Year	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17
Beaverhead															1			
Big Horn																	1	
Blaine						1							1					
Broadwater																		
Carbon					1		1											
Cascade Excl. of					3													
Great Falls					1	1							1					
Chouteau					1									1	1			
Custer					1		1											
Dawson									1									
Deer Lodge Excl. of					3	5												
Anaconda						2	1											
Fallon					1													
Fergus						1							1	1				
Flathead Excl. of																	2	
Kallispell					1				1									
Gallatin Excl. of																		
Bozeman																		
Granite																		
Hill					1	2												
Jefferson							1											
Lewis & C. Excl. of																		
Helena						2								1				
Lincoln					1													
Madison		1																
Meagher																		
Mineral					1													
Missoula Excl. of					2	3											1	
Missoula City						4												
Musselshell					1		1									1		
Park Excl. of						1												
Livingston					1								1					
Phillips																		
Powell					1													
Prairie						2												
Ravalli					1													
Richland					1			1										
Rosebud					1													
Sanders																		
Sheridan																		1
Silver Bow Excl. of					7	6		2										
Butte					9	5			2	1								
Stillwater					1													
Sweet Grass																		
Teton						1												
Toole																		
Valley						1						1						
Wibaux																		
Yellowstone Excl. of														1				
Billings					2													1
Carter		1				1												
Wheatland																		
TOTALS		2			40	39	4	3	4	1	1	3	5	3	3	3		

TABLE NO. 1—Continued.

JULY

	Totals		All Other Causes		Alcoholism		Suicide		Violence		Acute Intestinal Diseases		Malignant Tumors		Organic Heart Disease		Nephritis		Pneumonia		Whooping Cough	
	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17

TABLE NO. 1—Continued.

AUGUST

	Spotted Fever		Smallpox		Tuberculosis		Diphtheria		Scarlet Fever		Measles		Typhoid Fever		Meningitis		Anterior Poliomyelitis	
Year	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17
Beaverhead					1	1												
Big Horn																		
Blaine																		
Broadwater																		
Carbon																	1	
Cascade Excl. of					1			1										
Great Falls					2	1			1				2				1	1
Chouteau																		
Custer													1					
Dawson					1	2				1								
Deer Lodge Excl. of						2												
Anaconda										1					1			
Fallon																		
Fergus					1								1					
Flathead Excl. of					1										1			
Kalispell																		
Gallatin Excl. of																		
Bozeman																		
Granite																		
Hill													1					
Jefferson																		
Lewis & C. Excl. of										1								
Helena					2	1				1			1		1			
Lincoln									1	1								
Madison					2													
Meagher																		
Mineral																		
Missoula Excl. of					2													
Missoula City													1					
Musselshell																		
Park Excl. of																		
Livingston																		
Phillips																1		
Powell																		
Prairie																		
Ravalli					2													
Richland						1												
Rosebud					1								1					
Sanders																		
Sheridan							1	1							1	1		
Silver Bow Excl. of					4	5												
Butte					6	10							2		1			
Stillwater						1												
Sweet Grass																		
Teton						1												
Toole					1													
Valley					1													
Wibaux																		
Yellowstone Excl. of					1											1		
Billings						2											4	
Carter																		
Wheatland																		
TOTALS					27	29	1	2	1	5			9	2	5	2	6	1

## 47

AUGUST

Totals .....		All Other Causes .....		Alcoholism .....		Suicide .....		Violence .....		Acute Intestinal Diseases .....		Malignant Tumors .....		Organic Heart Disease .....		Nephritis .....		Pneumonia .....		Whooping Cough .....	
16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17
6	1	4	2					4	1				1						1		
1	4	1	3					1	1												
5	8	10	7					2	3												
8	37	8	21					4	5												
14	17	13	13					2	3												
10	9	6	9					1	1												
9	2	6	6					3	1												
13	13	11	5					3	2												
9	9	10	2					3	3												
3	4	4	4					2	1												
7	3	11	4					1	1												
3	7	8	3					1	2												
9	9	3	3					3	3												
12	12	9	8					5	3												
15	15	19	1					2	2												
1	1	7	1					2	1												
2	5	4	4					1	2												
6	16	11	12					3	1												
9	3	9	9					2	1												
1	1	1	1					1	1												
4	3	4	3					4	1												
1	1	1	1					1	1												
5	4	5	5					3	1												
2	2	2	2					1	1												
6	6	1	1					2	2												
1	1	2	2					1	1												
3	3	5	1					3	3												
1	1	1	1					1	1												
2	2	1	1					2	2												
3	3	2	2					1	1												
1	1	1	1					3	3												
2	2	1	1					2	2												
3	3	2	2					4	3												
1	1	1	1					2	2												
4	3	4	3					3	2												
1	1	1	1					2	2												
4	4	2	17					95	65												
10	13							10	13												
3	12							3	12												
132	132																				
174	174																				
445	445																				
439	439																				

TABLE NO. 1—Continued.

SEPTEMBER

	Anterior Poliomyelitis.....		Meningitis .....		Typhoid Fever .....		Measles .....		Scarlet Fever .....		Diphtheria .....		Tuberculosis .....		Smallpox .....		Spotted Fever.....		
Year .....	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	
Beaverhead .....						1													
Big Horn .....					1														
Blaine .....				2															
Broadwater .....																			
Carbon .....																			
Cascade Excl. of .....							1										1	1	
Great Falls .....			2																
Chouteau .....				2															
Custer .....			1																
Dawson .....			1	2															
Deer Lodge Excl. of .....			7	2															
Anaconda .....			1																
Fallon .....																			
Fergus .....			1																
Flathead Excl. of .....			1	1															
Kalispell .....			1				1												
Gallatin Excl. of .....			1																
Bozeman .....																			
Granite .....																			
Hill .....			3														1		
Jefferson .....																			
Lewis & C. Excl. of .....			1																
Helena .....				1				1											
Lincoln .....																	1		
Madison .....																			
Meagher .....																			
Mineral .....																			
Missoula Excl. of .....				2															
Missoula City .....																	1		
Musselshell .....																	1		
Park Excl. of .....																			
Livingston .....			1															1	
Phillips .....			1																
Powell .....				1															
Prairie .....																			
Ravalli .....																			
Richland .....																	1		
Rosebud .....																	1		
Sanders .....																			
Sheridan .....																	1	1	
Silver Bow Excl. of .....			2	6			1		2								1		
Butte .....			5	2			1		1										
Stillwater .....																		1	
Sweet Grass .....				1														1	
Teton .....																			
Toole .....							1												
Valley .....																		1	
Wibaux .....																			
Yellowstone Excl. of .....																	1		
Billings .....				1														3	
Carter .....																			
Wheatland .....																			
TOTALS .....			29	23	2	2		6						7	4	4	3	8	2



TABLE NO. 1—Continued.

OCTOBER

	Anterior Poliomylitis.....		Meningitis .....		Typhoid Fever .....		Measles .....		Scarlet Fever .....		Diphtheria .....		Tuberculosis .....		Smallpox .....		Spotted Fever.....		
Year .....	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	
Beaverhead .....					1														
Big Horn .....																			
Blaine .....																			
Broadwater .....																			
Carbon .....					1				1	1									
Cascade Excl. of .....					1														
Great Falls .....					2							2							
Chouteau .....					1														
Custer .....					1														
Dawson .....									1										
Deer Lodge Excl. of .....					7														
Anaconda .....					3														
Fallon .....																			
Fergus .....					1														
Flathead Excl. of .....																			
Kalispell .....					1														
Gallatin Excl. of .....																			
Bozeman .....																	1		
Granite .....					1														
Hill .....																			
Jefferson .....																			
Lewis & C. Excl. of .....					2				1										
Helena .....					1				3								1		
Lincoln .....																			
Madison .....					1														
Meagher .....																			
Mineral .....																			
Missoula Excl. of .....																			
Missoula City .....					2	2											2	1	
Musselshell .....						2													
Park Excl. of .....						1													
Livingston .....					1														
Phillips .....																			
Powell .....																			
Prairie .....																			
Ravalli .....					1														
Richland .....					2														
Rosebud .....					1														
Sanders .....					3														
Sheridan .....					4	1													
Silver Bow Excl. of .....			4		2	5													
Butte .....					10	5	1		2								1		
Stillwater .....																		1	
Sweet Grass .....																		1	
Teton .....																			
Toole .....																			
Valley .....																			
Wibaux .....																			
Yellowstone Excl. of .....					1												1		
Billings .....					1												1		
Carter .....																			
Wheatland .....																			
TOTALS .....			4		34	38	1	2	2	7					6	4	3	1	4

## REPORT OF THE STATE BOARD OF HEALTH

TABLE NO. 1—Continued.

OCTOBER.

[illegible]

TABLE NO. 1—Continued.

## NOVEMBER

	Anterior Poliomylitis.....			Spotted Fever.....			Smallpox .....			Tuberculosis .....			Diphtheria .....			Scarlet Fever .....			Measles .....			Typhoid Fever .....			Meningitis .....		
Year .....	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	
Beaverhead .....																											
Big Horn .....																											
Blaine .....						2												1									
Broadwater .....																											
Carbon .....						1														1							
Cascade Excl. of .....																					1						
Great Falls .....					3					1		1					1	2	1								
Chouteau .....																											
Custer .....					1	1																			1		
Dawson .....						1																					
Deer Lodge Excl. of .....						9																					
Anaconda .....					1																						
Fallon .....																											
Fergus .....					1				1																		
Flathead Excl. of .....						1																					
Kalispell .....					2				1																		
Gallatin Excl. of .....					1							1															
Bozeman .....																											
Granite .....						1																					
Hill .....					1		1																				
Jefferson .....																											
Lewis & C. Excl. of .....					2	1						1															
Helena .....						2						3						1			1						
Lincoln .....					1																						
Madison .....					1																						
Meagher .....																											
Mineral .....																											
Missoula .....																											
Missoula City .....					2																1						
Musselshell .....					1	1																					
Park Excl. of .....						1																					
Livingston .....																									1		
Phillips .....																											
Powell .....					1																						
Prairie .....																											
Ravalli .....					1																						
Richland .....																											
Rosebud .....																									2		
Sanders .....																											
Sheridan .....					2	2												2	1	1							
Silver Bow Excl. of .....					1	8	7					1												1			
Butte .....						6	12	a				2											1	1			
Stillwater .....																											
Sweet Grass .....					1																						
Teton .....																				1				1			
Toole .....						1																					
Valley .....					1																						
Wibaux .....																											
Yellowstone Excl. of .....					1																1						
Billings .....						1						1	1														
Carter .....																											
Wheatland .....																											
TOTALS .....					2	37	44	6	3		10	1			3	6	6	4	4								



TABLE NO. 1—Continued.

DECEMBER

	Anterior Polymyositis.....		Meningitis .....		Typhoid Fever .....		Measles .....		Scarlet Fever .....		Diphtheria .....		Tuberculosis .....		Smallpox .....		Spotted Fever.....		Year .....
	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	Year .....
Beaverhead .....							1												
Big Horn .....							1												
Blaine .....			1																
Broadwater .....					1	2													
Carbon .....				1	1	2			3										
Cascade Excl. of .....			1		1														
Great Falls .....			1	3			1												
Chouteau .....				2															
Custer .....				1															
Dawson .....			2																
Deer Lodge Excl. of .....			4	7			1												
Anaconda .....			1	1			2												
Fallon .....			1																
Fergus .....			1	3			1												
Flathead Excl. of .....			2	2															
Kalispell .....																			
Gallatin Excl. of .....																			
Bozeman .....																			
Granite .....				2			1												
Hill .....			3	1			1												
Jefferson .....				1															
Lewis & C. Excl. of .....							1												
Helena .....			2	1															
Lincoln .....				1															
Madison .....				1															
Meagher .....				1															
Mineral .....																			
Missoula Excl. of .....					1	2													
Missoula City .....				2															
Musselshell .....			1	1			1												
Park Excl. of .....							1												
Livingston .....																			
Phillips .....			1																
Powell .....				2															
Prairie .....									1										
Ravalli .....									2										
Richland .....						1													
Rosebud .....				1															
Sanders .....				2															
Sheridan .....																			
Silver Bow Excl. of .....			12	6															
Butte .....			2	4	9	2	1	4											
Stillwater .....																			
Sweet Grass .....				1				1											
Teton .....																			
Toole .....																			
Valley .....				1															
Wibaux .....																			
Yellowstone Excl. of .....																			
Billings .....				1															
Carter .....																			
Wheatland .....																			
TOTALS .....			1	2	41	51	8	5	4	15					2	3	5	6	1

## REPORT OF THE STATE BOARD OF HEALTH

55

TABLE NO. 1—Continued.

DECEMBER

[illegible]

TABLE NO. 1—Continued.

## TOTALS

	Spotted Fever			Smallpox			Tuberculosis			Diphtheria			Scarlet Fever			Measles			Typhoid Fever			Meningitis			Anterior Poliomylitis		
Year	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	
Beaverhead					2	2						2			1		1		1	1							
Big Horn						3		1										1						1			
Blaine					2	7												9		1							
Broadwater						2		1				1						3		1							
Carbon	1				3	6		3		2	4	9		1	2		1	2	2	1	1		1				
Cascade Excl. of			1		4	5		3		2		1	1	1			1	4	1	4		2			1		
Great Falls					22	17				4	1	3					8	2	7	1	4		2	1	1		
Chouteau					2	7				1							2		2	3	1		2	1		3	
Custer					7	10											2	1	3	1		2	1		2	1	
Dawson	1					8					1	3							7								
Deer Lodge Excl. of					24	56						1					2	6			3		1				
Anaconda					10	10		1		2		3									3		2				
Fallon					2	2					1							1	1	1							
Fergus					11	17				1		1	3					2	4	1	3						
Flathead Excl. of					10	12						2								1	3						
Kalispell					6	2				1		3					1		1	1							
Gallatin					3	2						1					1		3	1							
Bozeman					1	1											1				1	2					
Granite					3	3				1																	
Hill					12	9		1		1		1				2	1	1	1	1	3						
Jefferson					1	3		1																			
Lewis & C. Excl. of					5	3		1				4										1					
Helena			1		13	12						8					1	3	3	3	4						
Lincoln					3	5					1										1						
Madison			1		7	1																1				1	
Meagher					2							1															
Mineral					9																						
Missoula Excl. of						9		2		1							1	2	1			2					
Missoula City	1	1			14	17						3					2	2		3	2						
Musselshell					8	10		2				6								5	3	1					
Park Excl. of					1	4						1															
Livingston					5	1														2	1		1		2		
Phillips					6	2													1			1					
Powell					3	3				1																	
Prairie					2	2						1									1						
Ravalli	2	4		1	6	3		1		2									1								
Richland	1				1	6		1		1	1						2	1	2		1						
Rosebud					2	4																2					
Sanders					5	6															1		2				
Sheridan					12	7		1		1							1	2	3	2	4	1		2			
Silver Bow Excl. of			4	1	59	84				6		5	1	16	2						2	4				1	
Butte				2	86	91		12		5	1	1	16	2			4	3	1	8	11				2		
Stillwater					1	1		1					2												2		
Sweet Grass					3	1		1													1						
Teton					1	5						1								4	1	2					
Toole					1	2		1		2							1		1	1						2	
Valley					5	7		1				1					1		1	2						2	
Wibaux						1											1		1							1	
Yellowstone Excl. of					4	4				1							1	4	5	1							
Billings					10	11						1	2				2	6	2	4	9						
Carter			1			1																					
Wheatland																											
TOTALS	6	8	5	4	406	487	33		35	12	79	11	33	47	78	59	57	26	10								

TOTALS

Totals		All Other Causes		Alcoholism		Suicide		Violence		Acute Intestinal Diseases		Malignant Tumors		Organic Heart Disease		Nephritis		Pneumonia		Whooping Cough	
16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17	16	17
83	74	29	14	5	1	1	1	12	11	1	1	3	10	9	11	6	5	11	15	1	9
23	20	5	9	4	1	2	2	3	3	3	3	3	3	1	1	2	2	2	2	1	1
57	18	15	1	3	3	2	2	8	9	1	1	1	1	1	1	1	1	1	1	1	1
69	57	49	55	2	2	6	6	27	21	27	21	27	21	13	13	8	9	23	9	11	9
161	143	28	28	3	3	8	8	26	21	26	21	26	21	13	13	15	15	82	38	28	11
33	91	6	19	3	6	2	2	4	4	4	4	4	4	4	4	4	4	8	8	8	1
104	270	137	100	12	12	2	2	16	12	16	12	16	12	16	12	16	12	11	27	1	1
416	137	44	52	2	2	2	2	47	20	47	20	47	20	47	20	47	20	7	10	1	1
192	140	70	84	9	9	6	6	51	19	51	19	51	19	51	19	51	19	11	1	1	1
262	129	206	163	24	72	2	2	113	6	113	6	113	6	113	6	113	6	3	1	1	1
150	206	150	84	9	59	2	2	150	31	150	31	150	31	150	31	150	31	9	1	1	1
45	55	45	24	2	24	3	24	45	2	45	2	45	2	45	2	45	2	9	9	1	1
240	199	240	78	99	199	240	32	40	30	240	30	240	30	240	30	240	30	20	14	1	1
126	110	126	32	40	110	126	19	5	1	2	7	4	5	2	1	2	7	4	11	5	1
76	65	76	30	65	5	76	7	6	5	2	1	2	7	4	5	2	7	4	7	1	1
90	80	90	24	80	1	90	15	19	2	4	1	2	7	4	5	2	7	4	8	1	1
76	71	76	38	71	1	76	4	7	3	6	1	1	1	1	1	1	1	8	1	1	1
63	45	63	19	45	6	63	16	12	3	4	3	2	5	5	5	2	5	8	1	1	1
160	124	160	43	124	1	160	12	13	1	2	4	6	2	2	2	2	2	10	7	1	1
57	52	57	12	52	1	57	11	13	1	2	4	6	2	4	6	2	4	10	7	1	1
88	80	88	23	80	2	88	10	13	4	2	4	6	2	4	6	2	4	14	8	1	1
224	182	224	60	182	4	224	17	13	2	1	2	2	2	2	2	2	2	29	33	1	1
44	63	44	21	63	1	44	13	5	6	1	1	1	1	1	1	1	1	4	4	1	1
93	75	93	32	75	1	93	8	10	4	1	1	1	1	1	1	1	1	10	7	1	1
104	76	104	2	76	2	104	7	5	3	1	1	1	1	1	1	1	1	6	6	1	1
126	104	126	19	104	4	126	16	28	16	2	3	3	3	3	3	3	3	13	35	8	23
191	126	191	62	126	5	191	18	19	16	2	3	2	2	2	2	2	2	7	12	4	8
219	129	219	41	129	3	219	28	19	28	1	1	2	2	2	2	2	2	4	4	8	23
57	43	57	24	43	3	57	6	5	6	5	1	3	3	3	3	3	3	3	6	7	3
77	61	77	22	61	1	77	3	5	3	5	1	3	3	3	3	3	3	5	8	3	3
26	42	26	17	42	1	26	9	4	7	4	4	1	1	1	1	1	1	4	4	4	1
59	29	59	23	29	1	59	17	9	12	9	1	3	3	3	3	3	3	12	9	3	3
110	52	110	18	52	5	110	50	44	12	11	4	4	4	4	4	4	4	2	2	2	2
161	117	161	6	117	6	161	5	26	8	4	1	1	1	1	1	1	1	6	6	6	6
93	73	93	20	73	1	93	13	16	11	1	1	1	1	1	1	1	1	5	5	5	5
110	64	110	15	64	3	110	15	21	10	6	1	1	1	1	1	1	1	4	4	4	4
161	110	161	52	110	3	161	43	36	23	14	3	4	4	4	4	4	4	11	35	8	23
57	43	57	24	43	3	57	7	5	7	5	1	3	3	3	3	3	3	10	7	3	3
77	61	77	22	61	1	77	3	5	3	5	1	3	3	3	3	3	3	5	8	3	3
26	42	26	17	42	1	26	9	4	7	4	4	1	1	1	1	1	1	4	4	4	1
59	29	59	23	29	1	59	17	9	12	9	1	3	3	3	3	3	3	12	9	3	3
110	52	110	18	52	5	110	50	44	12	11	4	4	4	4	4	4	4	2	2	2	2
161	117	161	6	117	6	161	5	26	8	4	1	1	1	1	1	1	1	6	6	6	6
93	73	93	20	73	1	93	13	16	11	1	1	1	1	1	1	1	1	5	5	5	5
110	64	110	15	64	3	110	15	21	10	6	1	1	1	1	1	1	1	4	4	4	4
161	110	161	52	110	3	161	43	36	23	14	3	4	4	4	4	4	4	11	35	8	23
57	43	57	24	43	3	57	7	5	7	5	1	3	3	3	3	3	3	10	7	3	3
77	61	77	22	61	1	77	3	5	3	5	1	3	3	3	3	3	3	5	8	3	3
26	42	26	17	42	1	26	9	4	7	4	4	1	1	1	1	1	1	4	4	4	1
59	29	59	23	29	1	59	17	9	12	9	1	3	3	3	3	3	3	12	9	3	3
110	52	110	18	52	5	110	50	44	12	11	4	4	4	4	4	4	4	2	2	2	2
161	117	161	6	117	6	161	5	26	8	4	1	1	1	1	1	1	1	6	6	6	6
93	73	93	20	73	1	93	13	16	11	1	1	1	1	1	1	1	1	5	5	5	5
110	64	110	15	64	3	110	15	21	10	6	1	1	1	1	1	1	1	4	4	4	4
161	110	161	52	110	3	161	43	36	23	14	3	4	4	4	4	4	4	11	35	8	23
57	43	57	24	43	3	57	7	5	7	5	1	3	3	3	3	3	3	10	7	3	3
77	61	77	22	61	1	77	3	5	3	5	1	3	3	3	3	3	3	5	8	3	3
26	42	26	17	42	1	26	9	4	7	4	4	1	1	1	1	1	1	4	4	4	1
59	29	59	23	29	1	59	17	9	12	9	1	3	3	3	3	3	3	12	9	3	3
110	52	110	18	52	5	110	50	44	12	11	4	4	4	4	4	4	4	2	2	2	2
161	117	161	6	117	6	161	5	26	8	4	1	1	1	1	1	1	1	6	6	6	6
93	73	93	20	73	1	93	13	16	11	1	1	1	1	1	1	1	1	5	5	5	5
110	64	110	15	64	3	110	15	21	10	6	1	1	1	1	1	1	1	4	4	4	4
161	110	161	52	110	3	161	43	36	23	14	3	4	4	4	4	4	4	11	35	8	23
57	43	57	24	43	3	57	7	5	7	5	1	3	3	3	3	3	3	10	7	3	3
77	61	77	22	61	1	77	3	5	3	5	1	3	3	3	3	3	3	5	8	3	3
26	42	26	17	42	1	26	9	4	7	4	4	1	1	1	1	1	1	4	4	4	1
59	29	59	23	29	1	59	17	9	12	9	1	3	3	3	3	3	3	12	9	3	3
110	52	110	18	52	5	110	50	44	12	11	4	4	4	4	4	4	4	2	2	2	2
161	117	161	6	117	6	161	5	26	8	4	1	1	1	1	1	1	1	6	6	6	6
93	73	93	20	73	1	93	13	16	11	1	1	1	1	1	1	1	1	5	5	5	5
110	64	110	15	64	3	110	15	21	10	6	1	1	1	1	1	1	1	4	4	4	4
161	110	161	52	110	3	161	43	36	23	14	3	4	4	4	4	4	4	11	35	8	23
57	43	57	24	43	3	57	7	5	7	5	1	3	3	3	3	3	3	10	7	3	3
77	61	77	22	61	1	77	3	5	3	5	1	3	3	3	3	3	3	5	8	3	3
26	42	26	17	42	1	26	9	4	7	4	4	1	1	1	1	1	1	4	4	4	1
59	29	59	23	29	1	59	17	9	12	9	1	3	3	3	3	3	3	12	9	3	3
110	52	110	18	52	5	110	50	44	12	11	4	4	4	4	4	4	4	2	2	2	2
161	117	161	6	117	6	161	5	26	8	4	1	1	1	1	1	1	1	6	6	6	6
93	73	93	20	73	1	93	13	16	11	1	1	1	1	1	1	1	1	5	5	5	5
110	64	110	15	64	3	110	15	21	10	6	1	1	1	1	1	1	1	4	4	4	4
161	110	161	52	110	3	161	43	36	23	14	3	4	4	4	4	4	4	11	35	8	23
57	43	57	24	43	3	57</															

## DIVISION OF FOODS AND DRUGS

Section 10, Chapter 130, Laws of 1911 provide for the licensing of the following classes of business by the State Board of Health: Bakeries, confectioneries, canneries, packing houses, slaughter houses, meat market, dairies, restaurants, hotels, dining cars and lunch counters.

Regulations of the State Board of Health require proprietors of the various classes of business to observe certain rules of sanitation. Regulations further provide for a monthly inspection and scoring of all licensed establishments. When such score shows that licensees are not observing a required degree of cleanliness the State Board of Health gives a hearing to parties concerned at which time they may appear to show cause why their license should not be revoked. If parties fail to appear at the designated time, licenses are revoked and such parties may be prosecuted for conducting a business without a state license.

The success of this plan is dependent upon the regularity and thoroughness of the inspection by Health Officers of the various cities and counties of the State.

According to the outlined arrangement, action was taken against the following places during the past biennial period:

### Licenses Suspended

E. N. Rampou, restaurant, Butte, revoked October 4, 1917, reissued October 14th by consent of State Board when regulations of State Board were complied with.

Karabalos and Demos, restaurant, Butte, revoked by State Board of Health, October 4, 1917.

Paul Brothers, dairy, Lavina, license revoked October 4, 1917.

S. Makino, restaurant, Billings, license revoked October 4, 1917.

Jim Kong, restaurant, Billings, license revoked October 4, 1917.

No. Morimoto, restaurant, Billings, License revoked October 4, 1917.

Hum See, restaurant, Butte, license revoked October 4, 1917.

Mrs. N. R. Lewis, bakery, Conrad, extension of time given in order to repair building.

Hong Kong, restaurant, Butte, license revoked October 4, 1917.

Chas. Hanbow, restaurant, Kalispell, license revoked October 4, 1917.

Peter Plessas, restaurant, Butte, license revoked October 4, 1917. Prosecuted November 15, 1917, for conducting restaurant without license, fined \$25.00.

J. T. Bass, meat market, Broadview, license revoked October 9, 1918.

### Pure Food Law Administration

During the past biennial period the State Board of Health instituted proceedings against dealers for the sale of adulterated foods in seventy-nine (79) cases. Convictions have been secured in thirty-two (32) cases, twenty-eight (28) cases are pending, of which number one case is an appeal, twenty (20) cases have been dismissed by action of county attorneys. It might be stated here that excellent cooperation has been received from many attorneys in the enforcement of the Food and Drug Act. There are, however, a few counties where it is almost impossible to secure a conviction on account of the indifferent or careless attitude of the county officials.

Among the principal violations of the Food and Drug Act found during the past biennial period were: the sale of watered or partially skimmed milk, the sale of watered oysters, the sale of hamburger and pork sausage containing sulphite, the sale of lard containing beef fat, and the sale of distilled or malt vinegars for cider vinegar.

The following table shows the cases filed by the State Board of Health for violations of the Food and Drug Act.

Article	Pending	Dismissed	Conviction Secured	Total
Milk .....	9	15	3	27
Oysters .....	3	4	18	25
Pork Sausage .....	4	1	3	8
Hamburger .....	3	....	8	11
Vinegar .....	1	....	....	1
Lard .....	8	....	....	8
	28	20	32	80

The following is a detailed report of the individual cases with the result of the legal action taken.

## **ADULTERATED MILK**

### **Prosecution Instituted**

#### **Cases dismissed:**

Club Cafe, V. C. Wray, Prop., Bozeman, July 19, 1917.  
Success Cafe, K. Ligeros, Prop., Bozeman, July 19, 1917.  
Model Cafe, Hamilton, September 13, 1917.  
C. C. Corlett, Drummond, September 13, 1917.  
A. R. Schaunke, Livingston, September 13, 1917.  
Park Hotel, Livingston, September 13, 1917.  
Busy Bee Cafe, Livingston, September 13, 1917.  
Shapard Hotel, Missoula, September 13, 1917.  
R. H. Hamilton, Missoula, September 13, 1917.  
N. M. Anderson, Rosebud, September 13, 1917.  
Velvet Milk and Cream Company, Butte, September 13, 1917.  
Roe Ewerts, Conrad, January 22, 1918.  
Frank Comings, Conrad, January 22, 1918.  
Peter Klien, Conrad, January 22, 1918.  
E. S. King, Forsyth, August 1, 1918.

#### **Cases pending:**

Swan Regedahl, Livingston, August 1, 1918.  
Busy Bee Cafe, Livingston, August 1, 1918.  
Park County Creamery, Livingston, August 1, 1918.  
Missoula Creamery Company, Missoula, August 1, 1918.  
C. J. Jensen, Missoula, August 1, 1918.  
F. Schmidt, Butte, February 6, 1918.  
Matt Lorensen, Dillon, August 1, 1918.  
W. E. Ambrose, Dillon, August 1, 1918.

#### **Convictions secured:**

Ravalli Hotel, Hamilton, September 13, 1917. Fined \$22.50.  
S. C. Ferdig, Forsyth, found guilty by jury October, 1917, case  
appealed to higher court.  
P. Lazetich, Anaconda, November 6, 1918. Fined \$25.00.

## **ADULTERATED OYSTERS**

### **Prosecution Instituted**

#### **Cases dismissed:**

Cash Meat Market, Billings, December 20, 1917.  
State Meat Market, Billings, December 20, 1917.  
Billings Meat Market, Billings, December 20, 1917.  
Joe Weggenman, Helena, November 26, 1917.

#### **Cases pending:**

John R. Daily Company, Missoula, January 2, 1918.  
Edgar Meat Company, Billings, October 23, 1918.

#### **Conviction secured:**

George Bartz, Bozeman, November 19, 1917. Fined \$25.  
Union Cash Market, Helena, November 26, 1917. Fined \$25.  
Grady's East Side Market, Helena, November 26, 1917. Fined \$25.  
Helena Meat Company, Helena, November 26, 1917. Fined \$25.  
S. R. Neviel, Helena, November 26, 1917. Fined \$25.

Sanitary Meat Market, November 26, 1917. Fined \$25.  
Crystal Market, Smith Harrison, Prop., Billings, December 20, 1917. Fined \$25.  
Missoula Market, Missoula, January 2, 1918. Fined \$25.  
Koopman & Wissbred, Missoula, January 2, 1918. Fined \$25.  
Giebler & Garman, Missoula, January 2, 1918. Fined \$25.  
Leo Wing, Butte, January 2, 1918. Fined \$25.  
Washington Meat Company, Butte, January 2, 1918. Fined \$25.  
Henry Hitter, Butte, January 2, 1918. Fined \$25.  
Stevens & Manley, Butte, January 2, 1918. Fined \$25.  
Andrus Grocery Company, Butte, January 2, 1918. Fined \$25.  
Lutey Brothers, Butte, January 2, 1918. Fined \$25.  
Wheatland Meat Company, Harlowton, October 16, 1918. Fined \$30.  
C. J. Wagenbreth, Miles City, October 23, 1918. Fined \$25.

## ADULTERATED PORK SAUSAGE

### Prosecution Instituted

#### Cases dismissed:

Washington Market, Butte, August 23, 1917.

#### Cases pending:

John Barber, Butte, October 27, 1917.  
A. E. Schultz, Butte, October 27, 1917.  
Metropolitan Meat Company, Butte, October 27, 1917.  
Laurel Meat Company, Laurel, October 23, 1918.

#### Convictions secured:

Sladich and Poziga, Anaconda, November 29, 1918.  
Washoe Market, Anaconda, September 30, 1918. Fined \$25.  
Montgomery Meat Company, Anaconda, September 30, 1918. Fined \$25.

## ADULTERATED HAMBURGER

### Prosecution Instituted

#### Cases pending:

Washoe Market, Butte, January 14, 1918.  
Laurel Meat Company, Laurel, October 23, 1918.  
T. J. Genting, Butte, November 11, 1918.

#### Convictions secured:

Sladich & Poziga, Anaconda, September 30, 1918. Found guilty, fine paid.  
Washoe Market, Anaconda, September 30, 1918. Found guilty, fine paid.  
Boone and Manlove, Anaconda, September 30, 1918. Fined \$25.  
Balkovotz and Kordick, Anaconda, September 30, 1918. Fined \$25.  
C. J. Wagenbreth, Miles City, October 17, 1918. Fined \$25.  
Wm. F. Jacobs, Harlowton, October 16, 1918. Fined \$30.  
E. J. Neff, Terry, October 17, 1918. Fined \$25.  
P. J. Johannsen, Deer Lodge, December 14, 1918. Fined \$25.

### **ADULTERATED VINEGAR** **Prosecution Instituted**

Case pending:

Kermode Grocery Company, Butte, August 2, 1918.

### **ADULTERATED LARD** **Prosecution Instituted**

Cases pending:

E. J. Neff, Terry, October 15, 1918.

Northwestern Packing Company, Helena, October 2, 1918.

Sladich and Poziga, Anaconda, November 29, 1918.

Charles Mallender, Billings, October 19, 1918.

John Yuhas, Miles City, October 15, 1918.

Gorsich Brothers, East Helena, October 3, 1918.

Gorsich Brothers, East Helena, October 3, 1918.

John Bader, Bozeman, November 15, 1918.

---

## **DIVISION OF WATER AND SEWAGE**

The activities of this Division are well outlined in the report of the Director, Professor W. M. Cobleigh, which follows:

### **STATE DEPARTMENT OF PUBLIC HEALTH** **Office of the Chemist**

Bozeman, Montana,  
November 30th, 1918.

Dr. W. F. Cogswell, Secretary,  
State Board of Health,  
Helena, Montana.

Dear Sir:

I am transmitting herewith the report of the Chemist to the State Board of Health, for the biennial period ending November 30th, 1918.

Special acknowledgment should be made to the executive officers of the Montana State College for the use of special laboratory quarters set aside for the State Board of Health, and for the use of the equipment, belonging to the Department of Chemistry and Bacteriology, required to make laboratory examinations of foods, drugs, water and sewage.

The laboratory organization is under special obligation to Professor D. B. Swingle, head of the Department of Bacteriology of the State College for valuable services rendered as Consulting Bacteriologist.

Professor F. C. Snow of the Civil Engineering Department of the State College has very effectively served the Water and Sewage Division of the State Board of Health, in the capacity of Consulting Sanitary Engineer.

The efficient work of H. M. Shea, Analyst, and H. B. Foote—Bacteriologist, are properly credited in the text of the report.

I wish to express also my appreciation of the excellent support given to this division of the organization by yourself and your office.

Respectfully submitted,

(Signed) W. M. COBLEIGH,  
Chemist.

---

## MONTANA STATE BOARD OF HEALTH

---

Division of Foods and Drugs  
Division of Water and Sewage

---

### REPORT OF THE CHEMIST FOR THE BIENNIAL PERIOD, 1916-1918

---

W. M. COBLEIGH

The Chemistry Building of the State College at Bozeman, which furnished a large portion of the quarters for the Board of Health laboratories, was destroyed by fire on October 21, 1918. Fortunately all office records, reports and correspondence were saved. There was practically no loss of laboratory equipment used by this organization. New quarters were soon provided by the College and the work was resumed as promptly as possible. Therefore, it has been impossible to carry out the entire program of work that had been planned by the Chemist of the State Board of Health for this biennial period.

In the work of the laboratory war conditions were responsible for additional interruptions directly caused by the resignations of members of the laboratory staff. The following analysts and assistants have served at different times during portions of the biennial period; Henry A. Halvorson, Carl Gottschalck, Estelle Milnor, Donald H. Cook and W. C. Hansen.

In April, 1917, H. M. Shea, Food and Drug Analyst, was appointed Director of the Division of Foods and Drugs and his office transferred to Helena. On account of the shortage of chemists during the war, he returned to the laboratory in April, 1918, and in addition to his laboratory duties he has carried much of the work of the office of the Director of the Division.

A new and modern chemistry building with all the usual laboratory conveniences is now being erected on the State College campus.

Ample quarters for the Food and Drug Laboratory and the Water and Sewage Laboratory have been provided in the new building. The work of the organization will be greatly facilitated in the new building.

### Personnel

The staff at the end of the biennial period is given below:

W. M. COBLEIGH, Chemist and Director

H. M. SHEA, Food and Drug Analyst

H. B. FOOTE, Bacteriologist

F. J. O'DONNELL, Field Inspector

D. B. SWINGLE, Consulting Bacteriologist

F. C. SNOW, Consulting Sanitary Engineer

\*EDITH LUTHER, Assistant in Bacteriology and  
Chemistry

A. MONTGOMERY, Clerk

The duties of the Chemist of the State Board of Health are classified under two divisions:

#### 1. Foods and Drugs.

The results of analyses of food and drug samples collected by inspectors working under the direction of the Secretary of the State Board of Health are used in enforcing the State Food and Drug Act and the regulations promulgated under that act.

#### 2. Water and Sewage.

The investigations of public water supplies, sewage disposal plants and the studies of stream pollution conducted by the laboratory are used by the Secretary of the State Board of Health in enforcing the State sanitary laws and regulations.

The laboratory did not undertake many new projects during this biennial period. The most important new project was the introduction of the milk survey which took the place in a measure, of the routine examinations of samples of milk, submitted to the laboratory. For a number of years the State Board of Health has made systematic examinations of the qualities of market milk throughout the State. Samples of milk have been collected periodically by local health officers and submitted for laboratory investigation. This method of controlling the qualities of market milk has decided limitations. It is a better plan to send a laboratory representative into the field to make inspections of dairies and to secure samples of milk for a number of consecutive days in a given community for laboratory examination at the time of collection. The purpose and method of conducting milk surveys is described in another portion of this report.

The scarcity and high prices of many food materials during the period of the war have proven a great temptation to certain food producers to violate the provisions of the State Food and Drug Law.

In consequence it has been necessary for the Secretary of the State Board of Health to administer the food law in many particulars

---

\*Deceased.

with greater vigilance than ever. Many gross violations of the law have been detected and it has been necessary to recommend a number of cases for prosecution during the biennial period.

In several instances of food law violation the Board of Health cooperated with Federal officials of the Bureau of Chemistry, Washington, D. C.

For a time there were many rumors which created a general suspicion that certain foods contained added poisons. The laboratory investigated over fifty food samples which were under direct suspicion. The public was especially aroused concerning reports of the occurrence of powdered glass in food products. Laboratory examinations showed that the rumors were not well founded.

A complete reorganization of the method of conducting investigations of the sanitary qualities of public water supplies was made possible through the passage of a new water law by the last legislature. It has been possible to carry on a much more effective study of the water supplies of the State under this law than was possible in previous biennial periods. The details of the operation of this law are given in a subsequent portion of this report.

The Water Laboratory has prepared a copy for a circular setting forth the views of the State Board of Health in regard to the conditions under which safe ice can be harvested from ponds, lakes and rivers.

An illustrated bulletin has been prepared for the press which emphasizes the fundamental principles of sanitary science relating to the location, construction and operation of private water supplies. Investigations of farm water supplies have indicated the need for the dissemination of more general information of this character.

The results of investigations of the mineral content of underground waters in the state have been put in form for publication at a later date. A brief summary of some of the results is given in this report.

The bacteriological division of the water laboratory has found it necessary to investigate certain phases of the standard methods for water examination. The purpose of these studies is to make certain that the established procedures are adapted to Montana conditions in all particulars.

### General Summary

The following tabulation indicates the number and scope of the problems undertaken by the office of the Chemist. More detailed summaries are given in each of the two divisions of this report.

	Number
Food samples examined.....	1139
Drug samples examined .....	193
Milk surveys conducted .....	6
Water samples examined; sanitary.....	2500
Water samples examined for alkali.....	216
Field investigations, public and private water supplies .....	315
Efficiency tests of purification plants.....	8

## REPORT OF THE WATER AND SEWAGE LABORATORY

W. M. COBLEIGH, Chemist  
H. B. FOOTE, Bacteriologist

The program of work for the water and sewage laboratory is outlined below:

1. Investigations of public and private water supplies.
2. Efficiency tests of water purification plants.
3. Analysis of chemicals used for water purification.
4. Problems relating to swimming pool sanitation.
5. Efficiency tests of sewage treating plants.
6. Studies of cases of stream pollution.
7. Examination of plans for proposed water works and sewage treating plants.
8. Investigation of the mineral content of Montana underground waters, conducted in cooperation with the U. S. Geological Survey and the Department of Chemistry of the State College.

### Summary of Investigations

The following detailed summary indicates to what extent the above program of work has been carried out during the biennial period:

	Number
I. Laboratory Investigations of Water Supplies	
1. Public water supplies .....	633
2. Private water supplies .....	193
3. Coagulation tests .....	3
4. Swimming pool investigations .....	4
II. Field Investigations or Sanitary Surveys	
1. Public water supplies .....	122
2. Private water supplies .....	193
III. Classification of Samples Analyzed	
1. Water—sanitary examinations.....	2500
2. Water—mineral examinations	
a. U. S. Geological Survey.....	90
b. City supplies .....	31
c. Private supplies .....	95
3. Water—swimming pools .....	28
4. Water—coagulation tests .....	18
5. Ice .....	5
6. Chemical for water treatment .....	4
IV. Examinations of plans for proposed waterworks and sewage treating plants.....	17

### Investigations of Public Water Supplies

During the biennial period the water laboratory has been operated under the provisions of Chapter 126, Session Laws of 1917:

"An Act Giving to the State Board of Health Power to Require the Analysis of Waters Furnished and Sold to the Public, and to Provide Rules and Regulations for Said Analysis and for the Collection of Samples of Water and to Provide Funds to Cover the Cost Involved and to Prescribe Penalties for the Violation of Said Rules and Regulations."

#### Be It Enacted by the Legislative Assembly of the State of Montana:

Section 1. That the State Board of Health shall make and publish in the monthly bulletin of that Board, rules and regulations for the collection of samples and analysis of water either natural or treated, furnished by municipalities, corporations, companies, or individuals to the public and shall fix the fees for such service rendered under the rules and regulations to cover the cost of the service.

Section 2. That the fees collected by the State Board of Health, under this act shall be turned over to the State Treasurer, who shall place them in the State Board of Health maintenance fund and as much as is necessary of this fund shall be used for the State Board of Health water and sewerage laboratory, and the State Auditor shall draw his warrant for claims against this fund after such claims have been approved by the State Board of Examiners, provided, however, that this fund shall not be expended except after due appropriation.

Section 3. That every corporation, railway, common carrier company, or individual that shall fail to comply with the regulations prescribed by the State Board of Health under this Act, shall be guilty of a misdemeanor and upon conviction shall be fined not less than fifty (\$50.00) dollars, nor more than five hundred (\$500.00) dollars.

Section 4. All Acts and parts of Acts in conflict herewith are hereby repealed.

Section 5. This Act shall be in full force and effect from and after its passage and approval.

Approved Feb. 27, 1917.

The essential features of the above law were copied from a similar law enacted by the Kansas state legislature. The rules and regulations provided for in Chapter 126, were promulgated by the State Board of Health in Department Bulletin, Volume 10, No. 1, February, 1918, and are not reproduced in this report. The rules and regulations adopted under the new law have completely altered the policies of operating the water laboratory. The regulations required periodic investigations of all public water supplies in the State. A complete investigation consists of a careful inspection of the physical environment of all parts of a given water system from the sanitary aspect, and also a laboratory examination of an intelligently collected series of samples taken to represent the qualities of the

water in all parts of the system. An investigation of this character of each public water supply in the State is made every six months by a representative of the water and sewage division of the State Board of Health. More frequent periodic examinations are made of water samples collected by local health officials who are appointed by the State Board of Health. These water samples are sent to the laboratory in special containers furnished by the water division.

The laboratory examinations are conducted according to the standard methods of the American Public Health Association.

In conducting a field investigation of a public water supply, the following data is secured:

### FIELD INVESTIGATION

#### Public Water Supply

#### I Identification Data.

#### Date

1. Locality of Public water supply under investigation.
2. Ownership.
3. Map location of water supply and plant with respect to city or town.

#### II Local and Structural Data.

##### A. Source of Water:

##### 1. Surface:

- (a) Name of stream, lake or pond
- (b) Size of stream
- (c) Method of drawing water
- (d) Is an infiltration well used?

##### 1. Dept of well

##### Diameter

2. Construction
3. Strata between river and bottom of well
4. Distance from well to river
5. Describe the sanitary conditions around well
6. Relation to sewerage system
7. Is there a by-pass to the river?
- (e) Are human habitations located on the watershed above the intake to water system?
  1. State total population approximately
    - (a) Farm population
    - (b) Population, towns and camps
- (f) Are animals pastured on watershed?
 

No. approximately
- (g) Could drainage from human habitations pass into the stream during heavy rains or spring freshnets?
- (h) Are privies located near the stream or near any of branches?
  1. Give details
- (i) Does the stream receive city sewage or sewage from private disposal plants above the intake?
  1. Give details
- (j) Do picnic, fishing and hunting parties frequent the stream above the intake to the water system?

- (k) State the nature of the police protection of the watershed
2. Ground Water—Wells:
- (a) Location of well
  - (b) Kind
  - (c) Depth
  - (d) Strata
  - (e) Describe the casing, curbing and cover
  - (f) Does the construction of the well seem to be adequate to protect the water from pollution by surface drainage and infiltration?
  - (g) Method of drawing water
    - Yield
    - Gal. per day
  - (h) Sanitary aspect:
    - 1. Describe and state location of any nearby sewage disposal systems
    - 2. Distance from privy      From cesspool  
   From barnyards
    - 3. Depth of cesspool
    - 4. Depth of privy vault
    - 5. Depth to ground water
    - 6. Character of soil
    - 7. State chances of contamination reaching the well from above sources
- B. Storage of Water Supply.
1. Reservoir or tank
- (a) Location
  - (b) Structure
  - (c) Capacity
  - (d) Elevation
  - (e) Covering
  - (f) Gravity or pressure distribution
  - (g) Sanitary Aspect:
    - 1. When cleaned?
    - 2. How cleaned?
    - 3. Decomposition of structure in contact with water
    - 4. Character of sediment
    - 5. Surroundings from sanitary aspect
- C. Water Treatment:
- 1. Raw water      Turbidity
  - 2. Water treatment
    - (a) Sedimentation:
      - 1. How long?      Capacity of settling basins
      - 2. Depth of settling basins
    - (b) Coagulation:
      - 1. Material used
      - 2. For how long
      - 3. Where applied
    - (c) Filtration:
      - 1. Kind of plant and name of builder
      - 2. No. of units

3. How often washed?      How washed?
4. Location and construction of clearwell
5. Capacity of clearwell
6. Part time or full time service
- (d) Disinfection:
  1. Kind of plant
  2. Name of manufacturer
  3. Amount of disinfectant used per million gallons
  4. Place in system where disinfectant is applied
- (e) Water softening
- D. Distribution of Water:
  1. Sanitary Aspect:
    - (a) Relation to Sewer System:
      1. Relation of sewer effluent to water supply intake
      2. Is there danger of contamination under (1) above?
    - (b) Condition of mains
      1. Sediment in pipes
      2. Previous or present infection of water
      3. Previous or present disinfection of water
    - (c) Other sources connected for fire protection
      1. Give details
- E. Consumption of Water:
  1. Average daily consumption      Gallons
  2. Number of people supplied
  3. Total population
- F. Classification Recommended From Field Data
- G. Officials
  1. Name of local health officer
  2. Name of water works official designated to take regular samples
- H. Recommendations for Improvement:
  1. Enviroment
  2. Construction
  3. Location
  4. Police protection
  5. Treatment
  6. Operation

On completion of the field and laboratory investigations, complete reports on every public water supply in the State are made. In these reports each water plant is given a definite classification. On the basis of the facts brought out in the investigation, a supply is classed as "approved" or "unapproved." Definite recommendations relative to the physical enviroment, construction, location or operation of the water system are made for all plants that cannot be placed upon the "approved" list of public water supplies.

The total number of public water supplies in the State is 107. Of this number 43 are owned by private companies and 64 are owned by municipalities.

## Privately Owned Water Utilities

Company	Location
Anaconda Copper Mining Co.....	Anaconda
Alberton Water Works .....	Alberton
Bear Creek Water & Light Co.....	Bear Creek
Belgrade Water Co.....	Belgrade
Bridger Water & Light Co. ....	Bridger
Butte Water Co. ....	Butte
Beuschlein Water Works .....	Marysville
Big Elk Water Co. ....	Two Dot
Conrad City Water Co. ....	Conrad
Citizens Water Co. ....	Deer Lodge
Gardiner Electric Light & Water Co.....	Gardiner
Libby W. Wks., El. Lt. & Power Co.....	Libby
Little Chicago Water Works.....	Great Falls
Monida Trust Co. ....	Livingston
Mountain States Power Co.....	Big Fork
Mayo, Jos. ....	Deborgia
Missoula Light & Water Co. ....	Hamilton
Missoula Light & Water Co. ....	Missoula
Neihart Electric Light & Water Co.....	Neihart
Morris State Bank & Mendenhall .....	Pony
Northwestern Improvement Co. ....	Paradise
Oregon Short Line Railroad Co.....	Lima
Plains Light & Water Co. ....	Plains
Riberdy, E. T. ....	St. Regis
South Deer Lodge Water Co.....	Deer Lodge
Superior Electric Light & Water Co. ....	Superior
Saltese Electric Light & Water Co.....	Saltese
Talbott, J. A., Water Co.....	Columbia Falls
Thompson Falls Water Co. ....	Thompson Falls
Virginia City Water Co. ....	Virginia City
Valier Townsite Co. ....	Valier
Williams Light & Water Plant .....	Williams

## Municipally Owned Water Utilities

Big Timber	Glendive	Philipsburg
Billings	Great Falls	Polson
Bozeman	Harlem	Plentywood
Belt	Harlowton	Poplar
Baker	Havre	Red Lodge
Broadview	Helena	Roundup
Big Sandy	Hardin	Saco
Chinook	Hinsdale	Sheridan
Chester	Hysham	Shelby
Cut Bank	Joliet	Sidney
Choteau	Judith Gap	Stevensville
Clyde Park	Kalispell	Townsend
Culbertson	Lewistown	Twin Bridges
Cascade	Laurel	Troy
Columbus	Manhattan	Three Forks
Dillon	Miles City	Valier
Dodson	Moore	Wibaux
Eureka	Malta	Whitefish
Forsyth	Medicine Lake	White Sulphur Springs
Fort Benton	Melstone	Whitehall
Fromberg	Livingston	Wolf Point
Glasgow		

### Water Utilities Owned by Railway Companies

Northern Pacific Railway.....	Glendive
Northern Pacific Railway.....	Paradise
Northern Pacific Railway.....	Forsyth
Northern Pacific Railway.....	Laurel
Chicago, Milwaukee & St. Paul Railway.....	Harlowton
Oregon Short Line Railway.....	Lima
Gilmore and Pittsburg Railway.....	Armstead
Great Northern Railroad.....	Havre
Great Northern Railroad.....	Rexford
Great Northern Railroad.....	Neihart

### Classification of Public Water Supplies

The water systems of the cities given in the preceding list have all been classified from the sanitary aspect. As previously stated this classification is based upon the results of both field and laboratory investigations.

- I. The public water supplies of the following cities have been placed upon the "approved" list of public water supplies:

Alberton	Eureka	Plentywood
Belgrade	Geraldine	Poplar
(Proposed)	Glasgow	Red Lodge
Belt	Harlowton	Saco
Big Sandy	Havre	Sidney
Big Fork	Judith Gap	Thompson Falls
Bozeman	Kalispell	Three Forks
(Lyman Creek)	Lewistown	Valier
Butte	Libby	Virginia City
(Basin Creek Supply)	Malta	White Sulphur Springs
Cascade	Marysville	Whitehall
Choteau	Medicine Lake	Wolf Point
Columbia Falls	Philipsburg	

- II. Following is the list of cities, the public water supplies of which are "approved" because of the installation and operation of water purification plants:

Anaconda	Columbus	Laurel
Butte	Chinook	(Northern Pacific Ry)
(Big Hole & Moulton Supply)	Glendive	Great Falls
	Hamilton	Missoula
Billings		Miles City

- III. The following is a list of cities the public water supplies of which have installed purification plants. These plants do not meet all requirements of the State Board of Health. Final approval is deferred pending certain alterations that have been recommended for each plant.

Harlem	Little Chicago	Livingston
Laurel	Melstone	(Monida Trust Co.)
(Municipal)		

- IV. The water plants of the following cities have not been definitely classified. The final classification will depend upon the results of future investigations which will be conducted from time to time.

Baker	Fromberg	Sheridan
Bear Creek	Gardiner	Somers
Belgrade	Hardin	Superior
Bozeman	Hysham	Trident
(Sourdough)	Moore	Troy
Cut Bank	Neihart	Twin Bridges
Deer Lodge	Plains	Whitefish
(South Side Wtr. Co.)	Roundup	

- V. The public water supplies of the following cities have not been definitely approved. Classification is deferred pending the installation of improvements, or the making of alterations which have been specifically recommended for each plant.

Bridger	Dillon	Polson
Conrad	Forsyth	Saltese
Culbertson	Fort Benton	Shelby
Deer Lodge	Helena	Townsend
(Citizens Water Co.)	Joliet	Wibaux
	Manhattan	

- IV. Public water supplies on the "unapproved" list:  
Stevensville

### Efficiency Tests of Water Purification Plants

Water purification plants have been installed according to the list below:

#### Purification Plants

##### 1. Filtration only

Columbus

##### 2. Filtration and Disinfection

Billings	Great Falls	Livingston
Chinook	Harlem	(Municipal Supply)
Glendive		Miles City

##### 3. Disinfection only

Anaconda	Hamilton	Little Chicago
Butte	Laurel	Livingston
(Moulton & Big Hole Supplies)	Laurel	(Monidah Trust Co.)
Fort Benton	(Municipal)	Melstone
	(Northern Pacific Ry)	Missoula

Periodic efficiency tests of all of these water purification plants are conducted. Examinations of both raw and treated water are made. As far as possible it is the policy to conduct efficiency tests at each plant. The laboratory representative takes the necessary equipment to conduct the efficiency test on the ground. The following plants have installed laboratories which cooperate with this organization: Great Falls, Glendive, Billings and Miles City.

In addition to these efficiency tests, samples are submitted to the laboratory at frequent intervals by water works officials.



### Swimming Pool Sanitation

The number of swimming pools in operation in the State increases year by year and the department has not been able to make a general investigation of the operation of all of them. The only important investigation conducted along this line was made at the Morony Natatorium at Great Falls where the swimming pool water is purified by continuous filtration supplemented by disinfection with ultra violet light. If available funds permit during the next biennial period, it is the plan to make a general investigation of the conditions and the methods of operation of all swimming pools in the State.

### Investigation of Private Water Supplies

The State Legislature made special provisions in the State Board of Health appropriation for periodic investigations of the sanitary qualities of all public water supplies in the State. Practically only a small part of the appropriation is available for studying private water supplies.

It is, therefore, necessary to place some restrictions on the examination of water samples from private supplies, and the major portion of the money available must be spent on investigations of city and town supplies where many people obtain water from a common source. In this way the greatest benefits can be obtained for the largest number of people.

However, the State Board of Health recognizes the importance of giving citizens of the State as much information as possible on the potability of private water supplies. In order to impart this information and at the same time keep the cost of operating the water laboratory within the amount of available funds, it has been necessary to adopt regulations restricting the laboratory examination of samples of water from private supplies.

Laboratory examinations of water samples from private supplies will be made only on the recommendation of the local health officer within whose jurisdiction the supply comes, or of a regular representative of the Water and Sewage Division of the State Board of Health.

Before a health officer makes a recommendation he should satisfy himself that laboratory tests are really necessary by first making a physical examination of the environment of the supply from the sanitary aspect. This will eliminate the necessity of making analyses for the purpose of satisfying curiosity only.

When the health officer makes an inspection of the physical environment of a private water supply, he should keep in mind the chief points of sanitary science that apply to the source of water under investigation. An inspection should be made to determine the possibility of excreta reaching the water supply. In this connection it will be necessary to consider the environment of the source of water, the location, the construction and the operation of the supply.

After the health officer has made a careful inspection of a given water supply, he should decide whether a laboratory investigation is really necessary. If the inspection clearly indicates that there is no

danger of excreta reaching the water, a sanitary analysis is not necessary. The water will be pure from the sanitary aspect and it would be a waste of time and labor to make a laboratory examination of such water samples.

If it is apparent from the field inspection that the water supply could become contaminated with excreta because of faulty construction of the supply or because of an unsanitary method of sewage disposal, still a laboratory investigation may not be necessary. All that may be required under such conditions is to order the changes in construction, location and environment that are necessary to remove all danger of future contamination reaching the water supply. The procedure to recommend will often be very evident.

If the health officer finds that there is even a remote possibility of a water supply being unsafe for drinking, he should immediately order that the water be purified by boiling until he is satisfied that the changes he has ordered have been made in such a way as to adequately protect the water from future contamination. In this way it may be perfectly safe to omit a laboratory investigation.

If the health officer feels that it is necessary to have a laboratory examination of water samples to supplement his field investigation data, he should then make an application to the State Board of Health for sample containers and explain fully to the board the details of his problem. Complete directions for sampling will be furnished by the laboratory.

#### **Investigations of Plans for Proposed Water System and Sewage Disposal Plants**

A state law requires that all plans and specifications for proposed water works systems and sewage disposal plants be approved by the State Board of Health. To assist the executive officer, this division reviews all such plans and makes recommendations.

Plans and specifications for sewage disposal plants have been submitted from the following municipalities:

Wolf Points	Hysham
Scobey	Saco
Poplar	Bridger
Logan	

Plans and specifications for proposed water systems have been submitted from the following municipalities:

Scobey	Geraldine
Mildred	Ronan
Eureka	Laurel
Joliet	Forsyth
Bear Creek	

#### **Mineral Content of Montana Ground Waters**

A number of cities and towns in the State use underground water as a source of public water supply. In some sections of Montana underground waters contain an excessive amount of mineral matter in solution in a form popularly called "alkali". To secure a good quality of water in such a region, it is often necessary to drill a series of test wells. Samples of water from these wells are sent to the Board of Health for examination for mineral content and

the results, when compared, give valuable information which is used in selecting the best site for a municipal well. The water laboratory has rendered this character of service on a number of occasions to cities seeking an underground water supply with proper qualities.

Citizens of the State also make numerous requests for information on the qualities of underground waters from private wells which are used for domestic purposes. To satisfy the demand for information of this character considerable time has been devoted to the study of the character of the mineral content of Montana underground waters.

This study is now being conducted on the cooperative plan arranged by representatives of the Ground Water Division of the U. S. Geological Survey with the State Department of Public Health and the Chemistry Department of the Montana State College at Bozeman. This study has been under way for a number of years and it seems advisable at this time to give a very brief summary of some of the conclusions.

The presence of considerable mineral matter in solution in the underground waters of some regions of Montana is the natural result of early geological agencies and conditions. The mineral matter in solution is a mixture of well-known salts. Popularly these salts are termed, "Alkali" a more or less indefinite term.

When a chemist analyzes a typical Montana alkali water, he determines the amount of the following basic radicles. Iron and aluminum oxides calcium, magnesium, sodium and potassium and the following acid radicles, sulphate, nitrate, chloride, carbonate and bicarbonate.

Basic and acid radicles combine chemically to form salts. In reporting a water analysis the chemist sometimes makes calculations of possible hypothetical combinations of basic and acid radicles determined in the analysis and the data then shows the amount and kinds of mineral or alkali salt present in the water. When the water analysis reports are made after this method, the following compounds and salts will be found in the alkali waters of the various types occurring in the State.

Silica

Iron oxide and alumina

Calcium bicarbonate

Magnesium bicarbonate

Sodium bicarbonate, or baking soda

Sodium carbonate or salsoda

Sodium chloride or common salt

Sodium sulphate or Glaubers salt

Magnesium sulphate or Epsom salts

Calcium sulphate

Several common chemical salts are recognized in this list and these salts represent the ones usually found in Montana alkali waters. However, no single water contains all of these salts and, as a rule, some one salt predominates. It is, therefore, possible on

this basis to divide Montana Alkali waters into three classes. A number of salts are present in each class but the name of the class is taken from the component that predominates.

**Sulphated Waters.** The principal salt in solution in sulphated waters is generally sodium sulphate or Glaubers salts. On the average, sodium sulphate forms between 60% and 70% of the total mineral solids in this class. Magnesium sulphate or Epsom salt occurs much less frequently than Glaubers salts in Montana ground waters. Glaubers salts and Epsom salts are components of so-called "white alkali."

**Bicarbonated Waters.** The principal salt in solution in waters of this class is sodium bicarbonate or baking soda. Bicarbonated ground waters are found in a number of the important sections of the state. Sodium bicarbonate should be classed as a component of so-called "black alkali."

**Chloride Waters.** Sodium chloride or common salt is the principal ingredient in solution in this class. Chloride waters are not as common in Montana as waters of the first two classes. Sodium chloride should be classed as a component of "white alkali."

Sometimes it is impossible to classify a water under the above simple arrangement because two salts may be present in about equal amounts. However, this simple classification answers most purposes.

**Rating Alkali Waters for Human Consumption.** As far as known Montana ground waters do not contain any mineral salt or substance in solution that would be classed ordinarily as a poison. However, the mineral salts occurring in alkali waters have decided physiological effects. In fact, the character and concentration of these salts are often such as to give a water injurious effects. These facts should be taken into account in passing on the qualities of a given water for human consumption.

When the three classes of waters of the same concentration are considered separately, it is found, as a rule, that bicarbonated waters have the most injurious effect, the chloride waters next and the sulphated waters the least effect of the three classes.

Sodium bicarbonate or baking soda has an alkaline reaction which tends to neutralize the free acid of the stomach thereby producing undesirable disturbances in digestive processes.

A strong solution of sodium sulphate has what is termed a "salt action" in the intestines as a result of which water is drawn into the intestinal tract diluting the contents of the intestines. Peristalsis is also accelerated and, therefore, this salt in an alkali water has a laxative effect.

Magnesium sulphate has both a salting and irritating effect. It is, therefore, like sodium sulphate, a laxative salt, and on account of its irritating effect, much less of this salt can be tolerated than sodium sulphate.

The above salts are then most important in their physiological or medicinal effects when present in alkali waters. While it is possible to state with some small degree of definiteness the general immediate effect of one salt, it is much more difficult to predict the effect of a

mixture of several salts. The most obvious immediate effect on the digestive system of drinking water too high in mineral matter is diarrhea. With the information now available it is quite impossible to make definite statements on the permanent effects of long continued drinking of waters containing a high mineral content.

The problem is further complicated from the fact that the personal susceptibility to the physiological action of mineral salts varies with the individual.

Experience indicates that the tolerance for dissolved mineral matter in drinking water is much higher than is generally believed. It has further been observed that mineral tolerance increases with the continued use of alkali waters for drinking.

It should be further strongly emphasized that the information available on the subjects of physiological effects, personal susceptibility and mineral tolerance are very indefinite and uncertain.

These facts make it very difficult to establish at this time definite standards for rating the qualities of alkali waters for human consumption.

All proposed standards for rating the quality of alkali waters for human consumption should be regarded as tentative. The statements in the previous sections of this article are the basis for this assertion. However, it is possible to define standards that can be used as a general guide in interpreting analyses of alkali waters as they usually occur in Montana.

From observations of the properties and effects of waters of known mineral content, it seems safe to assert that waters containing any one of the following radicles in the amounts specified would be unhealthful to most people.

Bicarbonate radicle	$\text{HCO}_3$	700
Carbonate radicle	$\text{CO}_3$	350
Sulphate radicle	$\text{SO}_4$	1800
Chloride radicle	$\text{Cl}$	1500
Magnesium radicle		175

Water containing large amounts of two acids radicles make any application of standards more difficult because it is hard to judge the combined effect of two substances.

On the basis of the above statements it appears that chloride and sulphated waters containing from 2000 to 3000 parts of mineral matter per million should be looked upon as approaching the limit of mineral content for human consumption. The same rating for bicarbonated water would call for a still smaller total mineral content.

In the light of present knowledge it is impossible to specify the maximum limits of either the total mineral content or of the separate radicles making up the mineral salts which could be guaranteed to have no harmful effect after continued use. Many waters declared by experience to be unfit for drinking contain between 3000 and 3500 parts per million of dissolved mineral matter.

Alkali salts impart bad tastes to water when present in sufficient amount. As a rule, a water which does not have a disagreeable taste is acceptable for drinking from the standpoint of any

observed physiological effect the dissolved mineral substance might have. Water with high alkali content (2500 to 3000 parts or above) will have, as a rule, a characteristic taste which warns the settler against the use of waters containing such excessive and decidedly harmful amounts of alkali.

The standard based on total mineral content recommended below is offered as a tentative guide for classifying a water for human consumption from the tabulated analysis of the average Montana ground water. The qualifying statements apply particularly to people not accustomed to alkali waters for drinking.

Further the standard applies more accurately to sodium sulphated waters which do not contain an excessive amount of magnesium nor a high content of bicarbonate radicle.

Classification		Total Mineral Content Parts Per Million
Good	-----	0 to 500
Fair	-----	500 to 1200
	No distinct taste as a rule. Can usually be recommended for drinking.	
Acceptable	-----	1200 to 2000
	May have slight taste. Drinkable. Only few people offer objections. People using water under this class, report no observed harmful effects as a rule.	
Poor	-----	2000 to 2500
	Usually has a distinct taste. Drinkable for many people. Approaches limit of mineral content that should be tolerated. When found by experience to be objectionable, reduction of concentration of alkali by dilution with water free from mineral matter recommended. Rain water, ice water, or distilled water can be so used.	
Bad	-----	2500 to 3500
	Distinct taste. Many waters in this class considered unfit for drinking by people using such waters. Exceeds mineral tolerance for many people. Reduction of concentration by dilution recommended.	
Unfit	-----	3500 and above
	The usual water containing 3500 parts may safely be classed as unfit as a rule.	

It cannot be too strongly emphasized that a water containing a moderate amount of mineral matter in solution is preferably for domestic use to one that contains a great deal of mineral matter. It should be distinctly understood that all statements made in this report apply to waters in regions where alkali is abundant and where it is impossible to secure water with a low mineral content.

People who live for any considerable time in a region where alkali abounds become accustomed to water of high mineral content and hold very different opinions on the effects and properties of alkali waters, from people who have had no experience in using these waters.

It appears, therefore, that the only safe way to pass upon alkali waters is to adopt a standard of necessity which will make it possible to safely pass upon waters that must be used for domestic purposes. In other words, in an alkali region it is very necessary to use the best water available. All standards are based upon the above assumption.

The laboratory division has tabulated the results of several hundred analyses of underground water samples and the analytical data has been carefully studied. The complete results of this study will be published in bulletin form at a later date.

---

## REPORT OF AN INVESTIGATION IN PROGRESS IN THE BACTERIOLOGICAL WATER LABORATORY

---

H. B. FOOTE  
EDITH LUTHER

---

### Comparison of Special Media for the Detection of *Bacillus Coli*

Certain methods for the detection of *Bacillus coli* in water have become standard and have been adopted by workers as such. There are, however, details which as yet have not been decided satisfactorily. This is especially true where conditions exist as in Montana. Progressive laboratories throughout the country are striving to perfect these methods in all details. This is necessary, for until uniform methods are adopted by all workers along like lines, results obtained are not comparable. Progress is slow. Isolated investigations here and there must be pieced together to complete the whole.

During the past two years this laboratory has been conducting some investigations which have, it seems, a direct bearing on the problems in question. The comparison of special media, especially esculin bile salt agar with litmus lactose agar for the detection of probable *B. coli* has claimed attention.

Previous to this biennial period this medium was used exclusively here for this purpose. As this is not considered "standard" it was thought best to use it only in connection with litmus lactose agar or not at all until some investigations were conducted to determine its merits in comparison with the latter or "standard" medium.

Consequently a considerable number of samples of water—262—were taken more or less at random from the number which came into the laboratory in the routine business of examinations and analyzed in parallel, using both litmus lactose agar and esculin bile salt agar.

A brief description of methods of manipulation follows: Samples of water were inoculated into lactose broth fermentation tubes and incubated at 37°C for 24 to 48 hours. From tubes containing 10

per cent or more gas, both litmus lactose agar and esculin bile salt agar plates were made. Characteristic colonies, red on the former and black on the latter, were fished from these plates and inoculated into lactose broth tubes and gelatin stabs for confirmation.

Gelatin stab culture were made as it was customary to confirm black colonies on esculin bile salt agar by this method and information was desired as to the relative value of such a method.

In order to determine as nearly as possible the action of red colonies and black colonies in the opposite medium, cross transfers were made of red colonies to esculin bile salt agar and of black colonies to litmus lactose agar. In case of positive results or the production of characteristic colonies on the special medium thus inoculated, confirmation was carried on as in the straight inoculations made at the first.

Litmus lactose agar, lactose broth and gelatin were made according to methods described in the "Standard Methods for Water Analysis" A. P. H. A. 1916. The esculin bile salt agar was made and black colonies detected according to methods and descriptions by Harrison and Vanderleek.

When two separate things are to be compared, it is necessary, in order to arrive at any definite or workable conclusions, that one be considered as a known quantity or taken as the basis of comparison. Therefore, in this case the litmus lactose agar was considered to be the known quantity or the standard for comparison. The problem was attacked from this viewpoint, which places the esculin bile salt agar on the defensive so to speak.

General results only will be given here as it does not seem at this time that definite conclusions can be drawn from them.

In general then we have found that:

1. The esculin bile salt agar will produce a higher percentage of "characteristic" black colonies than will the litmus lactose agar from a given number of samples. This shows that as a means of detecting "probable B. Coli" the esculin bile salt agar will give more positive results than will litmus lactose agar.

2. A slightly smaller percentage of the black colonies will confirm in lactose broth than of the red colonies. This is especially true if a sample gives a black colony but not a red one. This does not hold as well when gelatin is used as is shown below:

Of 100 colonies (black and red):

- (a) 99 red confirmed in lactose broth while only  
93 blacks confirmed in lactose broth.
- (b) 87 reds confirmed in gelatin at 20°C while  
89 blacks confirmed in gelatin at 20°C.

This, it seems, would indicate that the gas-producing power and the failure to liquefy gelatin were not uniformly present in the organisms producing these characteristic colonies.

Or, again, placing the litmus lactose agar as the standard we found that arranged in order of number confirming in different media we have:

	Number positive
1. Red colonies in lactose broth.....	99
2. Black colonies in lactose broth.....	93
3. Black colonies in gelatin 20°C.....	89
4. Red colonies in gelatin 20°C.....	87

We find, therefore, that the black colonies are not as frequently positive as are the red ones by any method of confirmation.

However, it seems that by inoculating the black colonies into lactose broth we get a percentage of cases giving positive results approaching so close to that given by the red colonies under the same treatment that it is to be investigated further as a possible method.

3. In making cross transfers of black and red colonies to the opposite medium we found that 96 of the black colonies produced red ones while only 85 of the red colonies would produce black ones.

However, of the 85 black colonies thus produced, 83 or 97.6 per cent confirmed in lactose broth; and of the 93 red colonies produced from the black ones, 91 or 94.8 per cent confirmed in lactose broth.

This would seem to indicate that the black colonies first produced were as characteristically *B. coli* as were the original red colonies. This point needs further light and experiments are in progress which it is hoped will give an explanation of the apparent differences.

---

## Report of the Food and Drug Laboratory

---

### DIVISION OF FOODS AND DRUGS

---

H. M. SHEA, Analyst

The work of this laboratory in the investigation of foods and drugs offered for sale in this State may be classified into three divisions.

First, investigation of foods and drugs produced or manufactured in Montana and offered for sale here. To this class of products the laboratory is called to devote the greater portion of its time. This class includes such foods and drugs products as are especially liable to adulteration and misbranding, or those for which standards have been defined by state law or regulations of the State Board of Health. Under this heading may be included dairy products, meat, and meat products, confectionery, and beverages.

Second, foods and drugs which are obtained thru interstate commerce. This class of products may be subdivided into foods and drugs retailed in the original package and those which are retailed otherwise. Certain classes of interstate commerce food products are especially subject to adulteration or may be used for the purpose of adulteration. Examples of this class are fresh oysters, lard, or lard compounds, vinegar, olive oil, and certain drug preparations.

The Bureau of Chemistry of the U. S. Department of Agriculture is charged with the inspection of all foods and drugs entering interstate commerce. Since the passage of the Federal Food and Drug

Act in 1906, a great change has been effected in both the quality of food and drug products and in the labeling. Briefly stated, the object of all pure food legislation is to see that it is possible for the public to purchase what it thinks it is purchasing. A system of cooperation has been established between the various states and the Federal Government so as to afford a maximum amount of inspection of foods and drugs with a minimum amount of expense. The Bureau of Chemistry has generously assisted this department whenever we have made requests for information or assistance. Without this cooperation it would not have been possible for us to accomplish what we have during the past biennial period.

The third class of work of this department is the examination of miscellaneous, unofficial samples of foods and drugs submitted by citizens of the State. Such samples are usually suspected of containing poisonous substances. While the majority of such cases prove to be nothing more than rumors, still we are often able to gain valuable information thru such channels.

Over fifty samples of food have been submitted and examined for the presence of ground glass. Among these foods were bread, cereal, confectionery, peanut butter, jelly and canned vegetables. No ground glass was found in any case. In two samples of peanut butter, sand was found to be present; in one sample of bread, analysis, supplemented by inspection, showed that the bread had been contaminated with sand and plaster.

The number of samples submitted during the past period with requests of this nature has considerably increased. In two cases suspicions were well founded. First, a sample of sugar submitted by a rancher was found to contain strychnine sulphate; and, second, a sample of ginger snaps was found to contain yellow phosphorus, which had been placed between pairs of the cookies.

A survey of the solution of formaldehyde offered for sale in the agricultural districts of the state was made. This investigation extended over two seasons and was made to ascertain the truth or falsity of a rumor that impure formaldehyde was being sold with the object of injuring grain at the time of treatment previous to planting. The result of this investigation is gratifying, since in no instance was adulteration thru the addition of water found, and generally speaking, the solution of formaldehyde offered for sale in this State was of excellent quality.

Likewise, during the spring of 1918 a report that the strychnine offered for sale and used for the poisoning of gophers was impure, was found to be unfounded, as shown by the chemical analysis made by this laboratory upon samples of the alkaloid submitted by the State Entomologist and by county agents.

During the spring of 1917, while many people were preserving eggs in water-glass, a report gained considerable circulation that the water-glass being offered for sale in the State was impure and would not keep eggs placed in it.

It is unfortunate that such reports gain considerable circulation before they are proven false. The correction does not gain such circulation neither is it given such prominence, and as a result many

people are misinformed and prejudiced against certain products, brands of goods or dealers when such an attitude is entirely unwarranted by the facts of the case.

### Report of Foods and Drugs Analyzed

One thousand three hundred and thirty samples of foods and drugs were reported to the Secretary of the State Board of Health during the biennial period ending November 30, 1918. Table I is a classification of the foods analyzed, while table II is a classification of the drugs analyzed.

Table I, Summary of Foods Analyzed

Sample	Illegal	Legal	Total
Baking powders .....	0	5	5
Beans .....	5	3	8
Canned fruits and vegetables.....	0	7	7
Cereal products .....	3	13	16
Coffee .....	0	1	1
Coloring compounds .....	0	3	3
Confectionery .....	1	11	12
Dairy products:			
Butter, butter substitutes .....	5	29	34
Cheese .....	1	0	1
Cream .....	16	93	109
Ice-cream .....	11	62	73
Milk .....	129	440	569
Dried fruits .....	6	1	7
Egg substitutes .....	4	0	4
Flavoring extracts .....	4	17	21
Fruit juice and cider.....	0	4	4
Honey .....	0	1	1
Horseradish, ground .....	0	1	1
Jellies .....	0	1	1
Lard .....	6	14	20
Meat and meat products.....	4	10	14
Bologna .....	1	0	1
Hamburger .....	21	41	62
Pork sausage .....	7	19	26
Weinerwurst .....	2	0	2
Milk, condensed .....	3	4	7
Miscellaneous .....	5	16	21
Non-alcoholic beverages .....	3	9	12
Olive oil .....	0	6	6
Oysters .....	35	1	36
Peanut butter .....	2	3	5
Preservatives .....	1	3	4
Price's Canning Compound .....	1	0	1
Sugar .....	3	3	6
Syrup and molasses .....	2	19	21
Vinegars .....	5	7	12
Water-glass .....	0	4	4
Total .....	286	851	1137
Per cent foods illegal—25.1.			

The following samples of foods were not analyzed owing to the unsatisfactory condition of the articles at the time of arrival, cream 11, hamburger 1, ice-cream 5, milk 70, syrup 5, making a total of 92.

Table II, Summary of Drugs Analyzed

Sample	Illegal	Legal	Total
Alcoholic beverages .....	5	4	9
Ammonia water .....	2	0	2
Antiseptic powders .....	0	1	1
Carbolic acid .....	1	1	2
Cream tartar .....	0	15	15
Formaldehyde .....	12	74	86
Fowler's Solution .....	3	1	4
Hydrochloric acid, dilute .....	2	0	2
Hydrogen peroxide .....	5	4	9
Lime-water .....	1	1	2
Miscellaneous .....	0	2	2
Patent medicines .....	4	8	12
Prescription .....	0	4	4
Saccharin .....	1	3	4
Spirits of camphor .....	0	11	11
Spirits of peppermint .....	1	0	1
Strychnine .....	0	4	4
Sweet oil .....	6	8	14
Tincture of iodine .....	4	3	7
Turpentine .....	0	2	2
Total .....	47	146	193
Per cent of drugs illegal—24.3.			

### Baking Powders

Five samples of baking powder were examined and all showed, on analysis, more than ten percent available carbon dioxide as required by the standard adopted by the State Board of Health.

### Burma Beans

During the past biennial period the laboratory was called upon to examine several samples of beans which were suspected of being Burma beans, a variety closely resembling the navy-bean. The Bureau of Chemistry, U. S. Department of Agriculture, issued warnings against this variety because some samples were found to produce, on hydrolysis, appreciable amounts of hydrocyanic acid. Eight samples were examined at the laboratory and five were found to be Burma or Rangoon beans.

### Canned Fruits and Vegetables

One sample of canned peas was examined for copper sulphate with negative results. From an inspection of the markets of the state it is quite apparent that the practise of using copper sulphate in the greening of peas has been discontinued in compliance with Food Inspection Decisions, Numbers 92, 148 and 149, of the U. S. Department of Agriculture.

One sample of canned sweet potatoes was submitted for examination. This was suspected of containing ground glass. A small quantity of sand was found to be present.

One sample of canned corn was examined for saccharin with negative results.

Four samples of tomatoes were examined and were classed as legal.

### Cereal Products

Sixteen samples of cereal products were examined and three were classed as not passed. The majority of the samples were

submitted by citizens of Montana with the statement that they suspected the products of containing ground-glass or some poisonous substance. It may be stated here that, while we have examined a great number of food products for the presence of ground-glass, we have never found a case yet in which it was present. The ground-glass scare originated in the East, and, being of a sensational nature, the story was widely circulated.

### Coffee

One sample, a ground coffee of the cheaper variety, was examined for adulterants. No chicery, cereal, or other adulterants were found.

### Coloring Compounds

Three coloring compounds were examined and found to be in all cases permitted dyes. Coloring compounds are not being used in foods and confectionery to the extent to which they were in former years, and the coal tar dyes now used in foods, confectionery, and beverages are generally purchased from reputable manufacturers and are of the required purity.

### Confectionery

Twelve samples of confectionery were examined. The majority of these were examined principally in order to determine if the color present was a permitted dye. No illegal colors were found. One sample of candy of the co cocoanut variety was classed as illegal on account of rancidity.

### Dairy Products

Dairy products, being of a perishable nature, require attention the year round. It will be noticed from the number of samples analyzed under this heading that we have devoted a considerable proportion of our time to this work. Containers have been provided carrying six, one-pint bottles with bichloride preservative tablets, seals and inspector's blanks. These containers were shipped to health officers according to a schedule outlined by the Secretary of the State Board of Health. Containers are shipped express prepaid and are returned express collect by officers submitting samples. By following this plan it is possible for the laboratory to examine samples representing all section of the State in the least possible time.

The table given below shows the number of dairy products analyzed, the number illegal, the per cent illegal, and the samples not analyzed owing to their unsatisfactory condition on arrival at the laboratory.

Summary of Dairy Products

Sample	Not Analyzed	Illegal	Per Cent Illegal	Total
Butter and butter substitutes.....	0	5	15	34
Cheese .....	0	1	0	1
Cream .....	11	16	14.7	109
Ice-cream .....	5	11	15.1	73
Milk .....	70	129	22.6	569
Total .....	86	162	20.6	786

### Butter and Butter Substitutes

Thirty-four samples of butter and butter substitutes were examined. Of this number five were classed as illegal in that the moisture content exceeded 16 per cent.

### Cream

One hundred and nine samples of cream were received, of which sixteen were classed as illegal.

Viscogen, or sucrate of lime, was found to have been used during the preceding biennial period by certain dairymen in this State. Evidently this practice has been discontinued because of warning issued by the State Board of Health that the use of this substance in cream was illegal.

### Ice-Cream

Five samples were classed as illegal in that the butter fat was below the standard.

Five samples of the seventy-three received were unfit for analysis, owing to their condition on arrival at the laboratory.

### Milk

More time has been devoted to the examination of milk than any other article of food. Five hundred and sixty-nine samples were received, of which one hundred and twenty-nine were found to be illegal. Seventy samples were not analyzed owing to their unsatisfactory condition.

In certain other states it has been possible to conduct field examinations. The educational value of such work is, undoubtedly great. Such work has been attempted on a small scale by this department during the past year. Several cities have been visited by a bacteriologist for the State Board of Health and bacteriological examinations of the milk supply has been in cooperation with city health departments. A report of this work may be found elsewhere. At the time bacteriological samples were taken, duplicate samples were forwarded by express to this laboratory for chemical examination, and the milk was scored according to the score card adopted by the Dairy Division, U. S. Department of Agriculture.

State law requires retail milk to contain not less than 3.25 per cent milk fat and not less than 8.5 per cent solids not fat. Preservatives of any kind are entirely prohibited.

### Dried Fruits

During the past two years seven samples of dried fruits were examined. Of this number six were found to be adulterated, in that the product consisted in part of a filthy, diseased, decomposed, putrid or rotten animal or vegetable substance.

### Egg Substitute

Four eggs substitutes were examined to determine if the products were misbranded or adulterated within the meaning of the Food and Drug Act. In all cases the articles were classed as misbranded. In order that there might be a clearer understanding by the manufacturers as to what egg substitutes should contain and what qualities they

should possess, that their sale might be legal within the meaning of the Montana Food and Drug Act, the following regulations were drawn up and adopted by the State Board of Health:

On and after the fifteenth day of April, 1918, the following regulations shall be in force governing the sale of so-called egg substitutes in the State of Montana.

The term "egg substitute" shall be applied only to products which possess, within a reasonable degree, the properties of eggs both in respect to food value and baking qualities.

The term "egg powder" or "powdered eggs" shall be applied only to powdered, dried or desiccated eggs.

Compounds or mixtures offered for sale as substitutes for eggs must bear a coined or distinctive name. The word "egg" shall not be used or appear as a part of the coined or distinctive trade name given the product.

The use of artificial coloring in so-called substitutes must necessarily conceal inferiority or make the article appear better or of greater value than it really is. The baked product would, likewise, be adulterated within the meaning of the Montana Food and Drug Act. Therefore, the use of artificial coloring in such compounds is prohibited.

One of these products, which bore a name similar to the word "egg" and practically said, "this product is egg," on analysis by the laboratory of this department yielded the following results:

Net weight of contents.....	2½ ozs.
Moisture .....	9.52 per cent
Ash .....	1.13 per cent
Sodium carbonate .....	0.42 per cent
Sodium bicarbonate (baking soda).....	0.92 per cent
Casein (Protein=Nx6.25).....	4.72 per cent
Starch (by difference) .....	83.28 per cent
Total .....	100.00 per cent

Iodine test for starch—strong positive test.

Microscopical examination shows sample to consist largely of corn starch.

Color—coal tar dye—naphthol yellow.

Analysis shows that the entire contents of the can is equivalent in cooking value to about one-half of one egg.

The following statements appeared on the label of this can: "Contents of this package used instead of three dozen eggs for baking. Use as you would eggs in any recipe. Conforms to all Federal Pure Food Laws."

This product retails for twenty-five cents and, as analysis indicates contains only a few cents' worth of materials, chiefly corn starch. It is hard to imagine how two and one-half ounces of a product consisting chiefly of starch and very low protein content can take the place of three dozen eggs in baking.

It is the opinion of this department that such products are similar to eggs only in respect to the color they contain. Coal tar dyes are very strong colors and, therefore, when these egg substitutes are used they produce a golden yellow color such as is the effect of using eggs. This deceives the housewife into believing that these products really have some merit, when, in fact, she could produce the same result herself at a small fraction of the cost by using a little corn starch and a small pinch of yellow coal tar dye.

#### **Flavoring Extracts**

Twenty-one flavoring extracts were examined, seventeen of which were found to comply with state standards. Four samples of lemon extracts were found to be deficient in oil of lemon.

#### **Fruit Juice and Cider**

Four samples of apple cider were examined. All samples were of a satisfactory quality.

#### **Honey**

One sample of honey was examined and found to be free from misbranding or adulteration. The greater porportion of strained honey on the markets of Montana is produced in this State.

#### **Horseradish**

One sample of ground horseradish suspected of containing ground turnip was examined, but no such adulterant was found.

#### **Jelly**

One sample of grape jelly was submitted for examination with the complaint that it contained ground glass, but examination showed that no glass was present.

#### **Lard and Lard Compounds**

Regulations of the State Board of Health define lard to be exclusively the fat of hogs. If other edible fats such as beef fat or cottonseed oil products are added, the fact must be stated upon each container. During the past biennial period twenty samples of lard have been examined, of which six were found to contain beef fat, and one to be composed principally of a cottonseed oil product. Two samples of lard compound were examined and found to be properly labeled. An inspector from the State Board of Health reports that in one case the salesman attached a gummed label bearing the statement "lard compound, beef fat added" to a pail of lard after the article had been purchased for lard.

#### **Meat and Meat Products**

There is scarcely any use in forwarding samples of fresh meat to this laboratory for examination for poisonous substances unless the suspicions are well founded. We receive many samples each year that are more or less decomposed on arrival, and the examination of such samples may be generally considered a waste of time, energy and money. Fourteen samples of meat were examined. One sample suspected of being horse meat was found to be only a poor grade of beef.

#### **Bologna**

One sample of bologna was examined and classed as misbranded because an artificial color had been used on the casing, a fact

which was not declared on the package, at the time of sale. The practice of coloring the casings of such meat products as weiners and bologna should be discontinued entirely.

### Hamburger

At the end of the last biennial period we were about to assume that the practice of using sulphite as a preservative in the manufacture of hamburger had been broken up in this State. Now, at the end of a survey made toward the close of this biennial period, we find that such is not the case. Sixty-two samples of hamburger have been examined, of which, twenty-one samples, or about thirty-three per cent, were found to contain sulphite.

Following is a classification of hamburger samples examined:

City	Legal	Illegal	Total
Anaconda .....	1	6	7
Baker .....	1	0	1
Bozeman .....	4	0	4
Butte .....	17	10	27
Centerville .....	0	1	1
Helena .....	4	0	4
Harlowton .....	0	1	1
Laurel .....	0	1	1
Livingston .....	9	0	9
Miles City .....	1	1	2
Roundup (Not analyzed) .....	.....	.....	1
Terry .....	0	1	1
Three Forks .....	1	0	1
Walkerville .....	1	0	1
Whitehall .....	1	0	1
Total .....	40	22	62

### Pork Sausage

Twenty-six samples of pork sausage were examined, and seven of this number, or about twenty-seven per cent, were found to contain sulphite. The following table shows the number of samples examined and the localities from which they were obtained.

City	Legal	Illegal	Total
Anaconda .....	1	3	4
Baker .....	1	0	1
Butte .....	6	3	9
Helena .....	4	0	4
Laurel .....	0	1	1
Livingston .....	4	0	4
Roundup .....	1	0	1
Three Forks .....	1	0	1
Whitehall .....	1	0	1
Total .....	19	7	26

### Weinerwursts

Two samples of weinerwursts were examined and were classed as not passed.

### Condensed Milk

The following definition and standard for sweetened condensed milk, sweet evaporated or sweetened concentrated milk was adopted

by the Joint Committee on Definitions and Standards, August 7, 1916; and was approved by the Association of Official Agricultural Chemists, November 22, 1916:

"Sweetened condensed milk, sweetened evaporated milk, sweetened concentrated milk, is the product resulting from the evaporation of a considerable portion of the water from the whole, fresh, clean, lacteal secretion obtained by the complete milking of one or more healthy cows, properly fed and kept, excluding that obtained within fifteen days before and ten days after calving, to which sugar (sucrose) has been added. It contains, all tolerance being allowed for, not less than twenty-eight per cent (28.0%) of total milk solids and not less than eight per cent (8.0%) of milk fat."

Seven examples were examined of which number three were found to be illegal.

### Miscellaneous

The following table shows miscellaneous samples examined:

Lab. No.	Substance	Remarks
F 6008	Unknown liquid	Found to be solution of chloral hydrate
F 6123	Bread improver	Consists principally of potassium-aluminum sulphate and starch
F 6129	Cheese	Suspected of poison. None found
F 6230	Water-glass	Passed
F 6206	Soda biscuit	Suspected of poison. None found
F 6209	Water-glass	Passed
F 6401	Potatoes	Passed
F 6673	Apple	Passed
F 6687	Jello	Passed
F 6732	Peanuts	Contained white powder. Found to be dust from the shells
F 6756	Pie	Sent in from Conrad, Montana. Found to contain cigar stub
F 6790	Ground mustard	Analyzed at the request of the Domestic Science Department, Montana State College. Passed
F 6801	Crackers	Suspected of containing poison. None detected.
F 6908	Tobacco	Suspected of containing poison. No added poisonous substance found
F 6910	Cookies	Found to contain yellow phosphorus
F 6911	Unknown white powder	From Red Cross. Found to be ordinary salt
F 6916	Bread improver	Submitted by Domestic Science Department. Passed
F 6912	Cantaloupe	Passed
F 6995	Biscuit	Suspected of containing glass. None present
F 7000	Bread	Found to contain sand and plaster
F 7155	Doughnuts	Passed

### Non Alcoholic Beverages

Twelve samples of non-alcoholic beverages were examined. Of this number three were classed as illegal, owing to the fact that the state law relative to labeling had not been complied with.

### Olive Oil

Six samples of olive oil were examined and were found to be pure. There are but about six or eight well-recognized brands of olive oil on Montana markets and these are not likely to be adulterated.

### Oysters

During the past biennial period considerable time was devoted to examination of fresh oysters. November 1, 1917, the following circular was issued as a warning to dealers in fresh oysters in this State:

Attention is called to the fact that in the past it has been the practice, on the part of some dealers to add ice water, or water in the form of ice, to shucked oysters previous to the time of sale. It has been customary for some dealers to add from 25 to 33 per cent of water before selling such oysters. The resulting product is adulterated under the Food and Drug Act of 1911 in that "a substance has been mixed with the food so as to reduce or lower or injuriously affect its quality or strength," and also because "a substance has been mixed with the food so as to reduce or lower or injuriously affect its quality of strength," and also because "a substance has been substituted wholly, or in part, for the article."

The free liquor of shucked oysters should not exceed 10 per cent, occasionally, however, under certain conditions, oysters will show as high as 15 per cent. Refrigeration of fresh oysters must be accomplished by indirect, rather than direct, contact with ice, when ice is used for this purpose.

The State Board of Health, thru its Division of Foods and Drugs and representatives thereof, will contest this practice of adding water whenever such a condition is found to exist.

Considerable publicity was given this circular by newspapers throughout the State. On January 1, 1918, all licensed meat dealers in Montana were given the following notice, at the time their licenses were mailed.

Recent investigation has shown that it is common practice amongst dealers of fresh bulk oysters to add water, or water in the form of ice, previous to the time of sale. Federal inspection prevents the interstate shipment of oysters adulterated thru addition of water. The addition of water, in any form, to bulk oysters must be considered an adulteration, and the practice is on a par with that of the dairyman who adds water to milk.

Thirty-six samples of oysters were examined, of which thirty-five contained added water. The following table shows the number of samples together with the locality where they were purchased.

Sample	Illegal	Legal	Total
Billings .....	6	0	6
Bozeman .....	5	1	6
Butte .....	6	0	6
Great Falls .....	5	0	5
Harlowton .....	1	0	1
Helena .....	6	0	6
Missoula .....	5	0	5
Miles City .....	1	0	1
Total .....	35	1	36

### Peanut Butter

Five samples of peanut butter were examined, and two of this number were found to contain sand in considerable quantity. No satisfactory explanation has been made of the presence of sand in these samples, and it is but natural that such gritty substances in an article of food would arouse suspicions that glass was present.

### Preservatives

The more common preservatives for the curing of meat are now found to consist principally of saltpeter and salt. Four samples of preservative compounds were examined. One was classed as not passed owing to the fact that it consisted principally of sodium benzoate, a preservative whose use is governed by certain regulations. The label on the package carried no statement of the fact that the preservative compound therein was subject to certain restrictions in its use.

### Mrs. Price's Canning Compound

A recent analysis of Mrs. Price's Canning Compound gave the following results:

Boric acid .....	93.77 per cent
Sodium chloride .....	4.95 per cent
(salt)	
Salicylic acid, or salicylates .....	negative
Benzoic acid, or benzoates .....	negative

According to Section 2, Chapter 130, Session Laws of 1911, the following antiseptic and preservative substances are permitted in foods: "saltpepter, cane sugar, beet sugar, vinegar, spices, or in smoked foods, the natural products of the smoking process, or other harmless preservatives whose use is authorized by the State Board of Health."

The use of Mrs. Price's Canning Compound is illegal in Montana for the reason that the use of boric acid has never been authorized by law or regulations of the State Board of Health. The compound consists largely of boric acid which is a drug and is recognized as such by medical authorities. Taking the analysis given, it will be found that if one were to follow directions, in the use of this compound one quart of corn would contain 98.5 grains of boric acid. If one adult ate two portions of such corn in a day he would consume twenty-four grains of boric acid. An adult dose of boric acid is 8 grains according to the U. S. Pharmacopoeia, Ninth Revision.

### Sugar

Six samples of sugar were examined during the past biennial period, of which three were classed as not passed. One sample, submitted by a rancher, was found to contain strychnine. The second sample was found to contain small metallic particles, which

on examination were found to be sulphite of iron commonly known as "fool's gold." Brown particles present in the third sample of sugar were found to be bread crumbs.

### Syrup and Molasses

Twenty-one samples of syrups and molasses have been received and examined. Of this number two syrups were found to contain saccharin.

### Vinegars

Twelve samples of vinegar were received. Five of these were illegal in that they were found not to be the true vinegars for which they were sold. Many merchants throughout the state are not aware that the term "vinegar" in itself is applicable under state regulations to only one vinegar, namely, cider vinegar. Regulations of the State Board of Health recognize six varieties of vinegars.

### Water Glass or Silicate of Soda

During the summer of 1917, while many people were preserving, or about to preserve, eggs in water-glass, a report was circulated that the water-glass generally upon the market was of an inferior variety, and that eggs preserved in it would spoil. Accordingly, a few samples were purchased and examined. The report appears to have been unfounded for all samples were found to be of a satisfactory quality.

---

## DRUGS

While the investigation of drug preparations in the State has not been carried out to the extent which it was during the previous biennial period, yet a number of official representative samples were purchased by inspectors and submitted for examination. Several samples were submitted by citizens of the State in order that the quality of the preparation might be ascertained. For a summary of the drug preparations analyzed see table II. A more detailed report of the various preparations analyzed follows.

### Alcoholic Beverages

A total of nine alcoholic beverages was analyzed, five of which were classed as not passed. One unofficial sample of beer was found to contain strychnine sulphate. One sample of port wine was examined for strychnine with negative results. One unofficial sample of whiskey was found to contain strychnine. A second sample of whiskey, suspected of containing a poisonous substance, was examined but no added poisonous substance was detected. A third sample of whiskey was found to contain an excessive amount of tannin and was classed as not passed. One sample of alcohol was submitted in order to determine whether it represented grain alcohol or wood alcohol. The sample was found to be dilute grain alcohol. One sample of brandy was found to be free from adulteration and was classed as passed. Two samples of alcohol, examined as to purity, were found to comply with U. S. P. IX standard.

### Ammonia Water

Ammonia water is defined by the U. S. Pharmacopoeia, Ninth Revision, to be, "An aqueous solution of ammonia containing not less than 9.5 per cent, not more than 10.5 per cent, by weight, of ammonia gas, (NH<sub>3</sub>). This solution deteriorates on keeping and should be tested frequently. Preserve it in a cool place, in glass stoppered bottles made of hard glass, free from lead." Druggists are required to observe this standard in the sale of ammonia water. There is, however, upon the market, generally handled by grocery stores, a product known as household ammonia, which varies considerably in strength and oftentimes is not properly stoppered. Since the value of this solution depends upon the ammonia gas present it would seem that some definition should be made of the term "household ammonia" and dealers in the same in this State be required to conform to this standard in the sale of this product.

Two samples of household ammonia were examined and found to contain 4.56 per cent and 3 per cent of ammonia gas, respectively.

### Antiseptic Powders

One unofficial sample of antiseptic powder was examined for informational purposes.

### Liquefied Phenol, or Carbolic Acid

Liquefied phenol is a liquid containing not less than 87 per cent of phenol (C<sub>6</sub>H<sub>5</sub>OH). Two samples of carbolic acid were examined and found to contain 89 per cent and 75 per cent of phenol corresponding to pharmacopoeial strengths of 102 per cent and 86.2 per cent respectively

### Cream of Tartar, or Potassium Bitartrate

Cream of tartar has been adulterated with gypsum, chalk, alum, and amylaceous substances. Fifteen samples of cream of tartar, representing the product of as many different wholesale and jobbing firms, were examined, and no adulteration in any case was detected.

### Formaldehyde

Owing to the fact that the solution of formaldehyde is used to a great extent as a fungicidal agent by farmers in the treatment of grains, and because a rumor was circulated questioning the quality of formaldehyde offered for sale in this State, a great many samples were purchased from retailers, especially in the agricultural districts of the State, in the springs of 1917 and 1918.

It might be stated that the solution of formaldehyde requires a reasonable amount of care in its storing and method of handling in order to prevent deterioration. The U. S. Pharmacopoeia, Ninth Revision, directs that it should be preserved in a moderately warm place protected from light. The agencies of cold and sunlight induce a process known as polymerization and paraformaldehyde, a white gelatinous substance, is formed at the expense of formaldehyde, gas, the substance upon which the efficiency of the solution is dependent. The State Drug Law permits the handling of formaldehyde by general stores, hardware stores, etc., and frequently portions may be carried thru the winter season, oftentimes stored under improper conditions. Consequently, the bottom of a barrel will be

found to contain excessive amounts of paraformaldehyde. The question has been asked whether or not this solid would be injurious to grain at the time of germination since paraformaldehyde would revert to gaseous formaldehyde under such conditions. Prof. E. F. Ladd of North Dakota, states that germination might be retarded or the germinating power of the grain entirely destroyed if formaldehyde was present to a sufficient degree as a result of a reversion from the solid form. While it is evident from the dilution of the solution used in the treatment of grain that the chances for any paraformaldehyde being present of coming in contact with any considerable amount of grain are very remote, yet those handling formaldehyde should observe the proper precautions in order that paraformaldehyde should not be formed, and those purchasing the solution should see that the product is clear or transparent. The following table shows the results of our investigations during the springs of 1917 and 1918.

Lab. No.	Per Cent Formaldehyde by Wt.	Paraformaldehyde	City
F 6151	38.0		Billings
F 6152	38.3		"
F 6153	38.8		"
F 6154	40.5		"
F 6881	37.9		"
F 6882	36.8		"
F 6883	37.6		"
F 6884	39.2		"
F 6885	36.6		"
F 6886	37.6		"
F 6887	37.0		"
F 6906	36.6		"
F 6907	36.4		"
F 6142	39.1		Bozeman
F 6143	41.3		"
F 6144	39.4		"
F 6212	30.9		"
F 6213	Not analyzed		"
F 6842	37.8		"
F 6843	36.2		"
F 6844	40.2		"
F 6849	35.6		"
F 6204	36.8		Brady
F 6149	39.7	Present	Dillon
F 6150	37.7		"
F 6163	39.2		Glasgow
F 6164	39.2		"
F 6165	38.9		"
F 6166	38.6	Present	
F 6159	39.2		Glendive
F 6170	38.0		"
F 6171	39.6		"
F 6172	40.6		"
F 6173	38.8		
F 6174	38.2		Great Falls
F 6175	39.0		"
F 6176	32.6	Present	"
F 6177	40.0		"
F 6178	39.4	Present	"
F 6179	38.4		"
F 6180	39.6		"
F 6181	38.8		"
F 6182	39.2		"
F 6183	39.2		"
F 6184	39.4		"
F 6185	37.6		"
F 6190	39.0		Havre
F 6191	39.2		"
F 6192	39.0		"
F 6193	38.3		"
F 6194	39.6		"
F 6195	39.2		"

Lab. No.	Per Cent Formaldehyde by Wt.	Paraformaldehyde	City
F 6155	38.3	Present	Helena
F 6156	37.3		"
F 6157	38.3		"
F 6158	37.3		"
F 6159	38.2		"
F 6160	38.6	Present	"
F 6161	38.2		"
F 6167	38.8		Intake
F 6168	40.7		"
F 6186	39.2		Kalispell
F 6187	37.4	Present	"
F 6188	39.2	Present	"
F 6189	38.2		"
F 6137	38.1	Present	Livingston
F 6138	39.0	Present	"
F 6139	38.4		"
F 6140	38.7		"
F 6148	37.6		"
F 6845	38.0		"
F 6846	37.8		"
F 6847	36.6		"
F 6848	36.2		"
F 6131	40.0		Miles City
F 6135	39.6		"
F 6136	39.1		"
F 6196	38.0		Missoula
F 6197	38.4		"
F 6198	38.8		"
F 6199	39.4		"
F 6200	37.0	Present	"
F 6818	38.6	Present	Ollie
F 6201	40.0	Present	Plentywood
F 6202	40.0	Present	"
F 6851	21.6		Sidney
Total number of samples.....		86	
Number below standard .....		12 or about 14 %	
Number containing paraformaldehyde.....		12 or about 17.4%	
Number of samples not analyzed .....		1	
Average strength of 85 samples examined.....		38.2 per cent	

### Fowler's Solution

Fowler's Solution is an aqueous solution containing potassium arseniate, corresponding in amount to not less than 0.975 per cent nor more than 1.025 per cent of arsenic trioxide,  $\text{As}_2\text{O}_3$ . The solution should be preserved in amber-colored bottles. Four samples were analyzed with the following results:

Lab. No.	$\text{As}_2\text{O}_3$ Equivalent	Remarks
F 6893	0.9549	Not passed
F 6897	0.6630	Not passed
F 6900	0.9050	Not passed
F 6904	1.0168	Passed

### Hydrochloric Acid Dilute

Dilute hydrochloric acid is an aqueous solution containing not less than 9.5 per cent nor more than 10.5 per cent of HC. The solution should be preserved in glass stoppered bottles. Two samples were analyzed and found to contain 10.8 per cent and 9.5 per cent.

### Hydrogen Peroxide

Hydrogen peroxide or hydrogen dioxide is an aqueous solution containing not more than 3 per cent by weight of hydrogen peroxide,  $H_2O_2$ , corresponding to not less than ten volumes of available oxygen. It should be preserved in a cool place protected from light. Nine samples of hydrogen peroxide were examined during the past biennial period representing practically all brands offered for sale in this State. Following are the results obtained:

Lab. No.	Per Cent $H_2O_2$	Remarks
L 6103	3.03	Passed
F 6096	3.03	Passed
F 6097	3.16	Passed
F 6098	3.02	Passed
F 6099	2.79	Not passed
F 6101	2.96	Not passed
F 6095	2.88	Not passed
F 6102	2.82	Not passed
F 6094	2.82	Not passed
Total samples analyzed .....		9
Total samples not passed .....		5

### Lime-Water

Lime-water is an aqueous solution containing not less than 0.14 per cent of calcium hydroxide,  $Ca(OH)_2$ , at 25°C. Two samples of lime-water were analyzed and one was found to be below standard.

### Patent Medicines

Twelve patent medicines were analyzed, some for informational and others for official purposes. Four were found to be illegal under our present food and drug laws.

Four prescriptions were analyzed for informational purposes and passed.

### Saccharin

Owing to the sugar restrictions imposed upon manufacturers of confectionery, ice cream and soft drinks, during the past biennial period, these dealers were required to use sugar substitutes such as glucose or corn syrup, honey, and other similar sweetening agents. The Bureau of Chemistry, U. S. Department of Agriculture, went to considerable trouble in order to investigate and prepare desirable sugar substitute formulas for the use of the manufacturers. Certain manufacturers, however, evidently decided that the use of the drug, saccharin, was preferable from their standpoint, and accordingly many orders have been placed for saccharin by manufacturing concerns. The cost of one pound of saccharin is from \$28 to \$33. Assuming that the sweetening power of saccharin is five hundred times that of cane sugar, the sugar equivalent of one pound of saccharin, at eleven cents per pound, would cost \$55, or a profit for the manufacturer using saccharin of from \$22 to \$27 per five hundred pounds of sugar. This practice should not be permitted, if for no other reason than it constitutes unfair competition. Saccharin is a drug. It has no food value, and its use in food products

has been prohibited by the Bureau of Chemistry, U. S. Department of Agriculture, the organization which is charged with the enforcement of the Food and Drug Act applying to interstate commerce products.

Four samples of saccharin were examined, and one was found to be adulterated in that it contained approximately 50 per cent of cane sugar.

The Bureau of Chemistry handled this case, as the saccharin was an interstate commerce product. An order of seizure was issued. The defendant failing to appear, the product, consisting of ten pounds, value \$280, was ordered destroyed by the court.

#### **Spirits of Camphor**

One hundred mils of spirits of camphor should yield not less than 9.5 grams nor more than 10.5 grams of camphor.

Eleven samples of spirits of camphor were analyzed and found to comply with U. S. P. IX standards.

#### **Spirits of Peppermint**

Each one hundred mils of spirits of peppermint should contain ten mils of oil of peppermint.

One sample of spirits of peppermint was examined and found to be deficient in oil of peppermint.

#### **Strychnine**

During the spring of 1918 four samples of strychnine were examined for the Biology Department of the Montana State College to determine the purity of the alkaloid. This examination was desired in order to correct a rumor that the alkaloid, which was being used to poison gophers, was impure.

The four samples examined were found to comply with pharmacopoeial tests of purity.

#### **Sweet Oil**

Food Inspection Decision 139, issued by the U. S. Department of Agriculture, February 23, 1912, declares sweet oil to be olive oil.

Fourteen samples of sweet oil have been purchased as such, of which number six were found to be composed of cottonseed oil.

#### **Tincture of Iodine**

Tincture of iodine is an alcoholic solution of iodine and potassium of iodide. One hundred mils should contain not less than 6.5 grams nor more than 7.5 grams of iodine, and not less than 4.5 or more than 5.5 grams of potassium iodide.

Seven samples of tincture of iodine were examined. Four samples were found to be deficient in iodine, or potassium iodide, and were classed as illegal.

#### **Turpentine**

Two samples of turpentine were examined upon the inquiry as to whether or not they were of sufficient purity to be sold for drug purposes. The samples were found to comply with U. S. P. IX tests, and were classed as passed.

#### **Miscellaneous**

One sample of sodium bicarbonate was examined and found to be of satisfactory purity. One sample of extract of witch hazel, examined, was classed as passed.

## MILK SURVEYS

H. B. FOOTE

During the past year milk surveys have been conducted in a few of the larger towns of the state.

The purpose of these surveys is two-fold:

First, to acquaint the dairyman with the essentials concerned in the production of clean milk and to show him what constitutes milk of a good sanitary quality and high food value.

Second, to acquaint both the producer and the consumer with the actual quality of the milk.

Incidentally much knowledge has been gained by the State Board of Health as to the general sanitary quality of the milks examined and the care exercised in their production.

For a guide in this work a Market Milk Score Card adopted from that of the Dairy Division, U. S. Department of Agriculture, has been used.

This card scores or grades any milk, taking into account seven features. These seven features consider the sanitary quality, the food value and the marketable value of a milk sample. They are given below with a statement as to the method of judging score value. The number following each feature is the score value, the sum of all equaling 100 points. The milk to be scored is most often purchased in the original container from the wagon.

### Bacteria (35)

The bacterial content of a sample is determined quantitatively by the plate method. Incubation of plain nutrient agar plates for forty-eight hours at 37°C. is followed by a counting and calculation of total counts. Dilutions usually of 1-1000 and 1-10,000 are made in sterile water blanks. For this purpose glass-stoppered bottles holding 15 cc. and 125 cc. are used. These allow of sufficient shaking when holding 9 cc. and 99 cc. of sterile water. This shaking is necessary for the best results.

### Flavor and Odor (25)

These features are tested by tasting and smelling the milk which has just been opened and shaken. An attempt is always made to procure two or more judges of these qualities as individual tastes vary and even an experienced judge may be unfitted for making nice distinctions by too much tasting and smelling.

The importance of these features lies in their indication of methods of handling the product as well as the actual quality of the milk. Too much heating in pasteurization, insufficient cooling after milking and foreign substances are often detected by experienced judges.

### Visible Dirt (10)

There are two ways in which this feature is tested. The most accurate is by use of the sediment tester. A given quantity of milk, usually a pint, is filtered through a small cotton disc. The insoluble material, consisting of manure, hair and other foreign substances, is caught on the white surface. This disc is then dried and compared

with standard discs which may be made up with varying amounts and kinds of "dirt." These are useful in keeping a permanent record for comparisons.

A second method of scoring milk on this feature is by raising the bottle carefully above the head and examining the bottom for signs of "dirt." It may be gently tilted from side to side when small particles may be seen to move slowly downward along the glass bottom. This helps to distinguish between the foreign substances and flaws in the glass. This method is not so accurate though more rapid perhaps than the former.

The quantity and quality of this visible dirt should be studied carefully for it often gives a clue to careless dairy or milk room methods.

#### **Fat (10)**

In scoring this feature the Babcock method is used. The fat content in milk is the constituent of greatest commercial and food value. Legal limits have been placed upon the minimum fat content allowable and in Montana this is 3.25 per cent.

#### **Solids Not Fat (10)**

These are of next importance from a commercial or food standpoint. Legal limits have also been placed upon these and in Montana are 8.5 per cent.

These last two features are scored from tests made in the State Food and Drug Laboratory.

#### **Acidity (5)**

This feature is scored in the field by titration against a standard sodium hydroxide solution, phenolphthalein being used as an indicator. The acid thus determined is reported as lactic acid.

Often age or careless milkroom methods are detected by these tests. The score card gives a perfect score in this feature to milk containing 0.2 per cent or less acid.

#### **Bottle and Cap (5)**

This feature is of importance from the commercial as well as the sanitary standpoint. The scoring is done by examination of the bottle and cap before it is tampered with in making the other tests. Cracked and dirty bottles or broken and leaky caps are some of the conditions looked for.

Copies of the score card used may be obtained upon application to the Chemist, State Board of Health, Food and Drug Laboratory, Bozeman, Montana.

All features with the exception of the fat and solids not fat are scored in the field. A traveling laboratory equipment for making all tests is carried. Often it has been possible to cooperate with the laboratory maintained in connection with the water purification plant or municipal laboratory of the city. Such was the case in Great Falls and Glendive. Several days are required to complete any one survey and during that time there is opportunity for citizens and officials to become acquainted with the purpose of the work.

### Visits to Dairies

Near the close of a survey it is the practice to make a visit with the local health officer or milk inspector to the dairies or other places where milk is handled. It has been found advisable to obtain the laboratory data before making these visits since in many instances a good weapon is thus at hand for ferreting out undesirable or careless methods, or results are obtained which can be used to encourage a careful and conscientious producer.

With the laboratory data at hand the dairyman has often been educated in the necessity and methods of sterilization, cleanly milking, efficient cooling, and clean and quick delivery.

The results of any survey are tabulated for each dairy or supply and a copy of the scoring for the samples taken from any such dairy or supply is placed in the hands of that dealer. The health officer or milk inspector is fully acquainted with the results obtained and the recommendations made in each case.

The ultimate purpose of the scoring of market milk should be the placing on the market of clean and wholesome milk, one of our best and most nourishing articles of diet. The dairy business must be fostered in our state and especially the production of milk that is above suspicion from the sanitary standpoint.

Below is tabulated the work already done.

Date	Cities	Number of Samples
September 11, 1917	Livingston	5
November 20, 1917	Helena	10
December 20, 1917	Great Falls	35
December 21, 1917	Helena	12
April 16, 1918	Bozeman	11
May 27, 1918	Glendive	10
June 1, 1918	Miles City	11
Totals .....	6 cities 7 surveys	94 samples

The future plans for this work in Montana call for a continuation of these surveys with return visits to places where surveys have been made. The "follow up" work in this matter is of great importance as it is only through such work that permanent results are assured.





